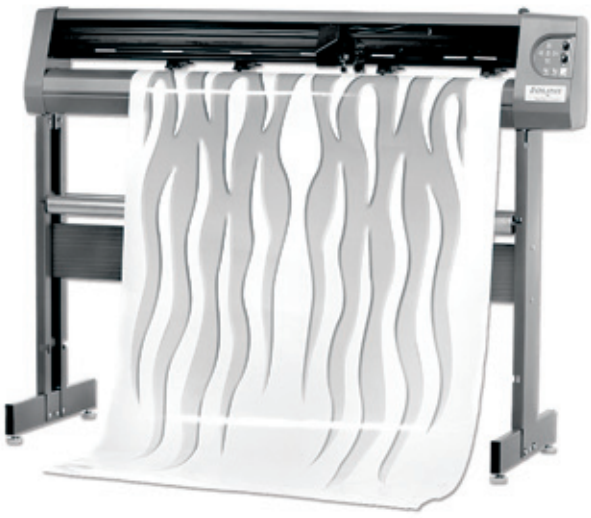
IOLINE™

User Guide

I/S Series

SC Series



IOLINE SMARTRAC™

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Part Number 106844 Rev. 3

IOLINE SMARTRAC™

User Guide

I/S Series **SC Series**

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GLOSSARY

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Safety & Cautions

Please read these safety guidelines before beginning operation of the signcutter. The signcutter uses a very sharp blade when cutting. The parts can move quickly. Always observe the following safety precautions:

- Do not allow the material to become suddenly taut between the plotter and a roll of material during plotting. A service loop of unrolled material is required for problem free operation. Using the **Autoloop** function (enabled in the **Control Center**) will create the required service loop by gently pulling a set amount of material from the roll before cutting. Ioline recommends using the **Autoloop** function when plotting on a roll of material.

- Do not try to repair the machine without factory authorization. Only qualified service personnel should attempt any disassembly or access to internal components. If external mechanical adjustments are necessary, turn off the signcutter and disconnect it from all power sources (both the computer and the wall outlet).

- Be careful with hair, jewelry, or loose clothing near the signcutter. They can become caught in the mechanical parts.

- Never move the carriage by hand. Use the **Arrow** keys and let the machine do it.

- Keep hands away from the carriage when the signcutter is in operation. The carriage will automatically move to its right end position when the power is turned on.

- Be careful when lifting the signcutter. Hold the bottom surfaces of the signcutter to lift or move it.

- Keep fingers away from the drive shaft when the signcutter is in operation.

- Use caution when changing a blade in the blade holder. *See the Routine Maintenance chapter of this **User Guide** for the recommended procedure*.

- Be careful when handling the blades. They are sharp and could cause an injury if mishandled. Although the blades are made of an extremely hard material, they are brittle and can break if dropped or mishandled.

KEY

A. Dust Cover
B. Drive Shaft Marker
C. Carriage
D. Blade Holder
E. Idler Wheel
F. Drive Shaft (beneath vinyl)
G. Pinchwheel
H. Pinchwheel Lever

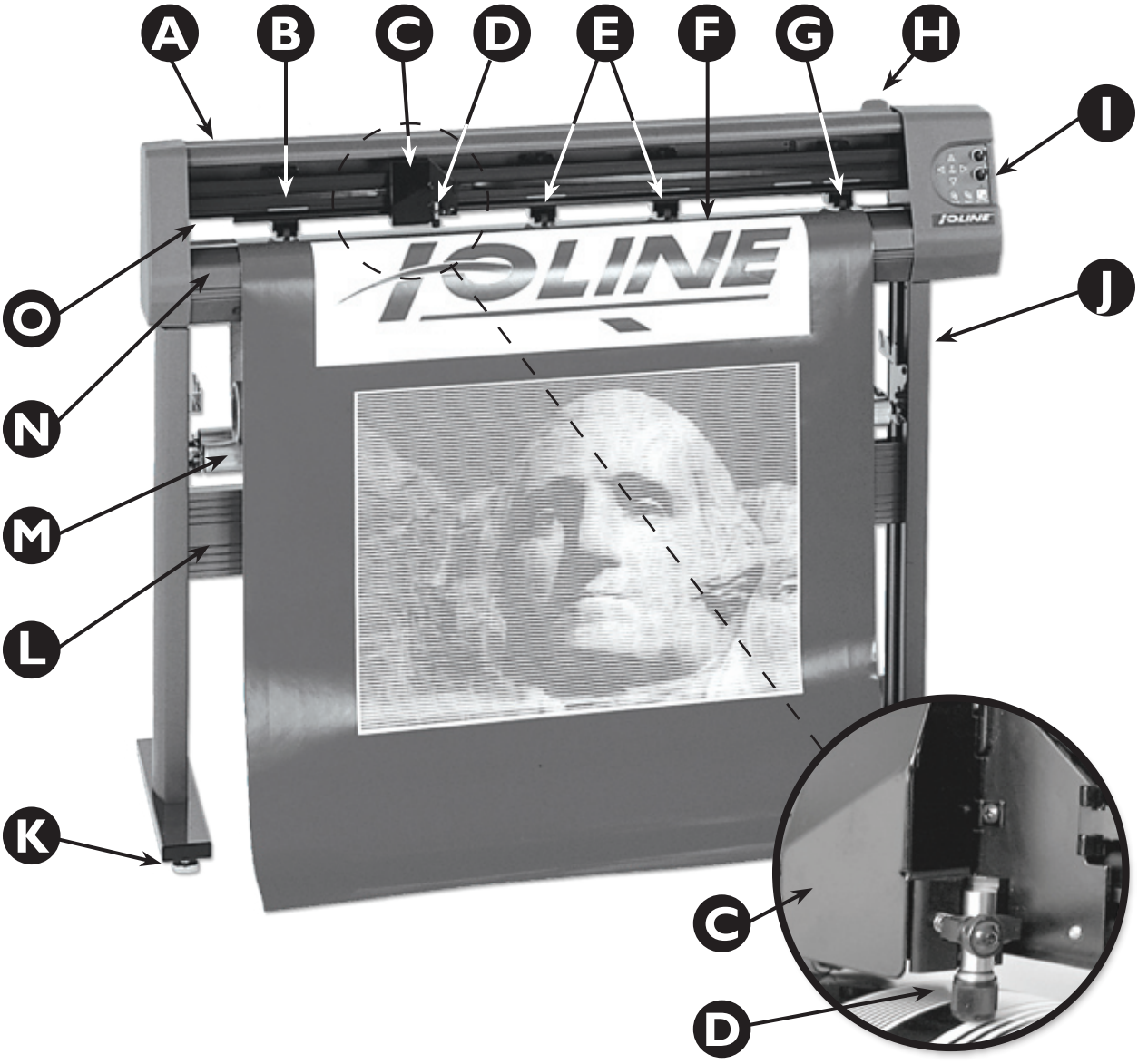


Figure 1. The Ioline SmarTrac I/S cutter front view.

KEY

I.	Keypad	**M.**	Media Roller
J.	Stand Leg	**N.**	Platen
K.	Stand Leveling Foot	**O.**	Traverse
L.	Cross-member	**P.**	LED Sensor

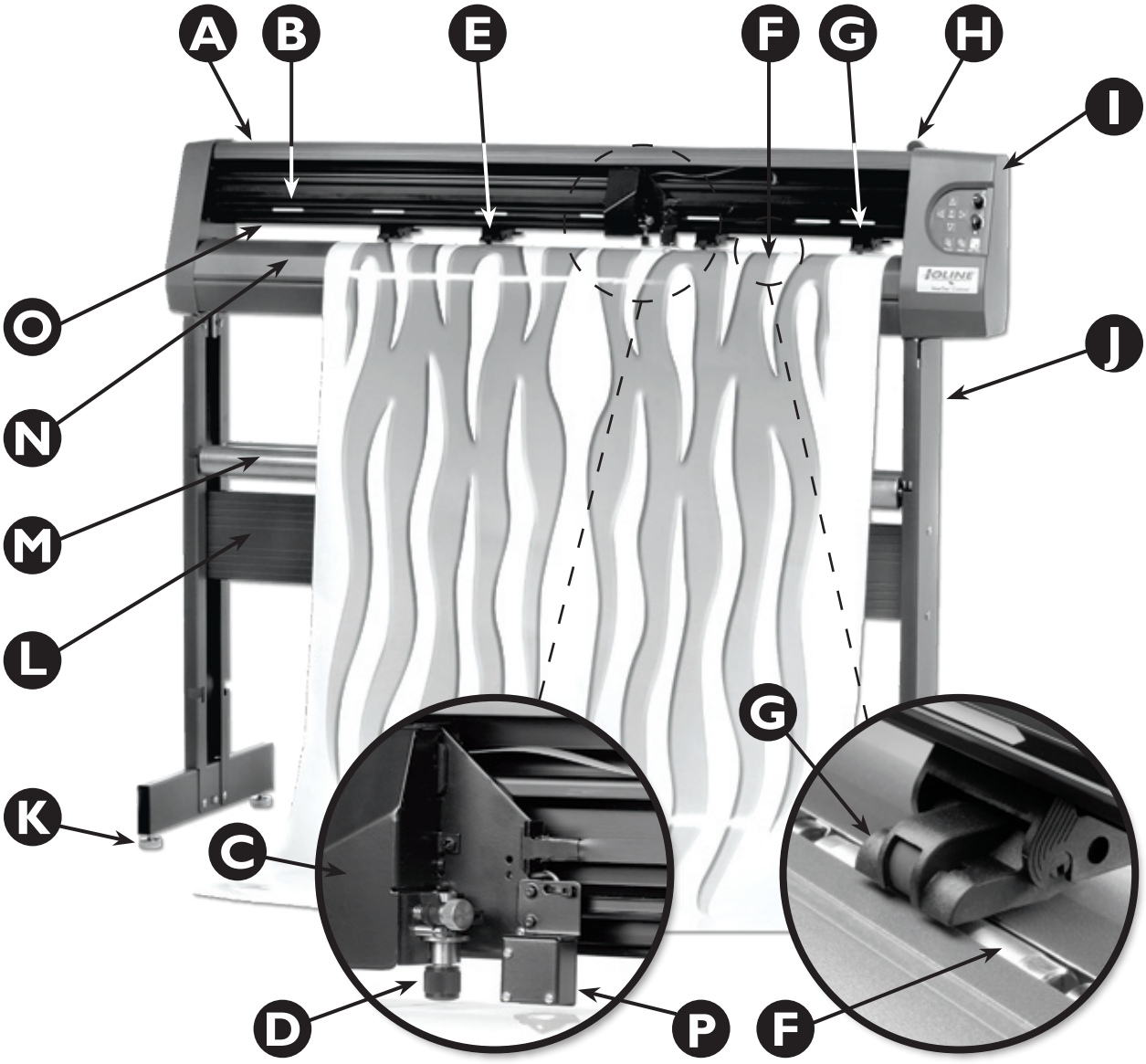


Figure 2. The Ioline SmarTrac Contour (SC) cutter front view.

KEY

A. Dust Cover
B. Drive Shaft Marker
C. Idler Wheel
D. Carriage
E. Blade Holder
F. LED Sensor
G. Pinchwheel
H. Drive Shaft

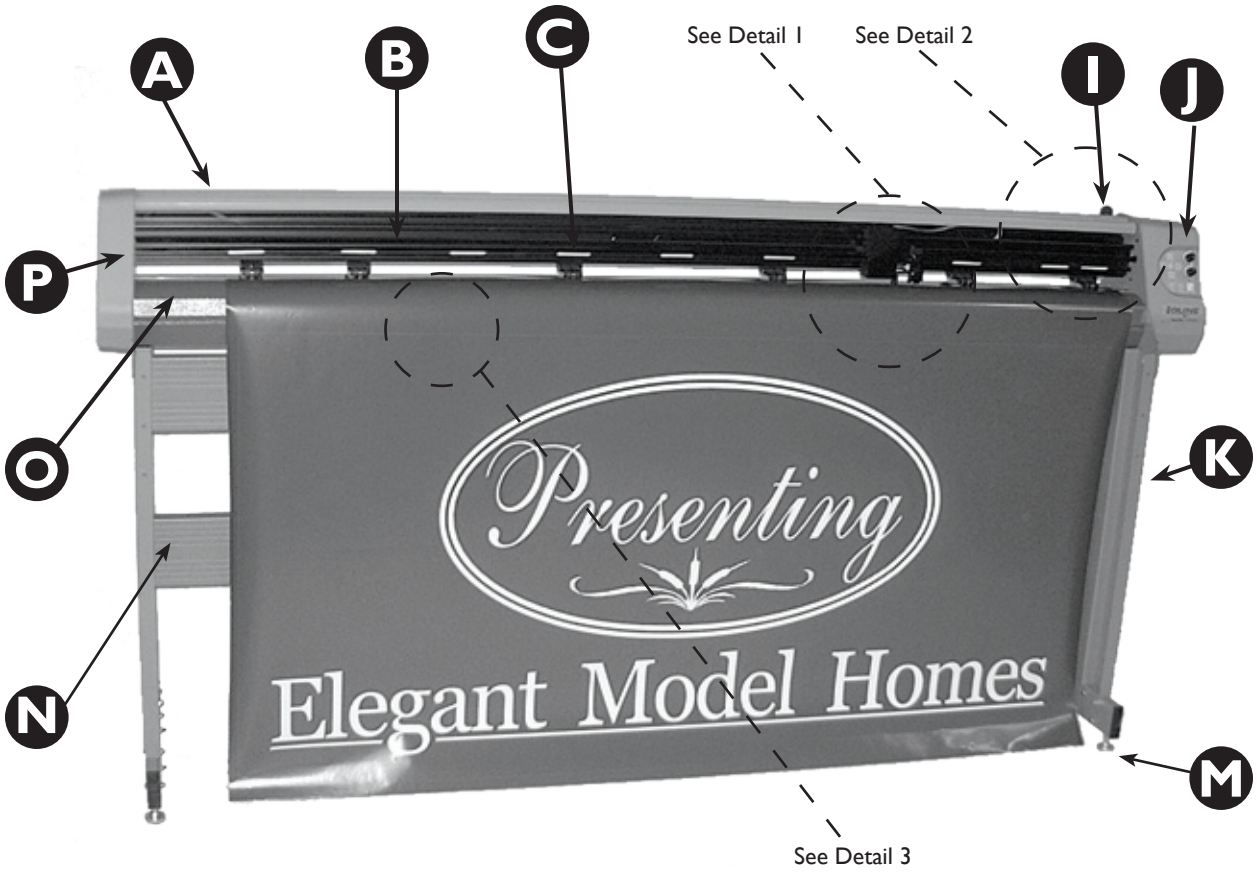
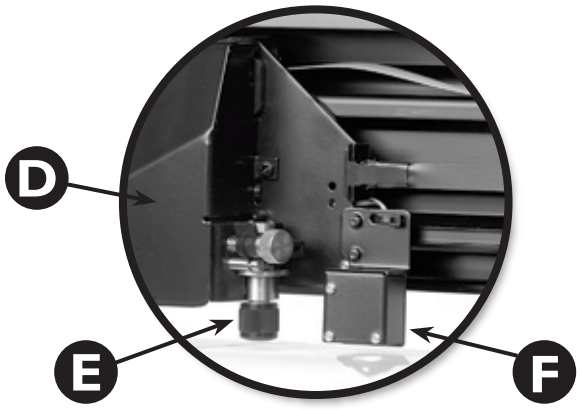


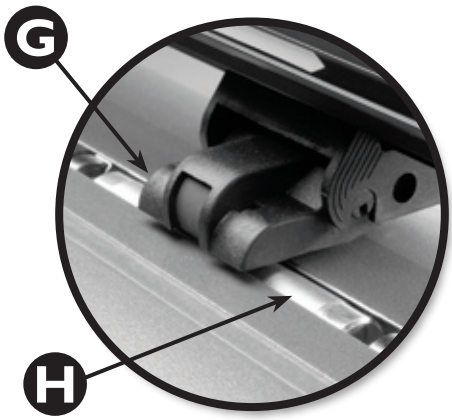
Figure 3. The Ioline SmarTrac SC-72 cutter front view.

KEY

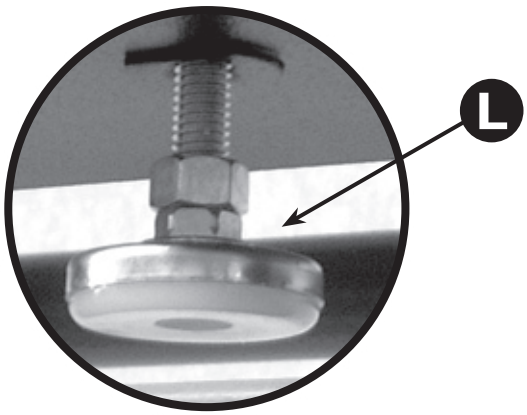
K. Stand Leg
L. Platen Leveling Foot
M. Stand Leveling Foot
N. Cross-member
O. Platen
P. Traverse



Detail 1



Detail 2



Detail 3

KEY

Q. Media Shaft (in rear)
R. Power Switch
S. Serial (COM) Port
T. USB Port
U. Power Cord

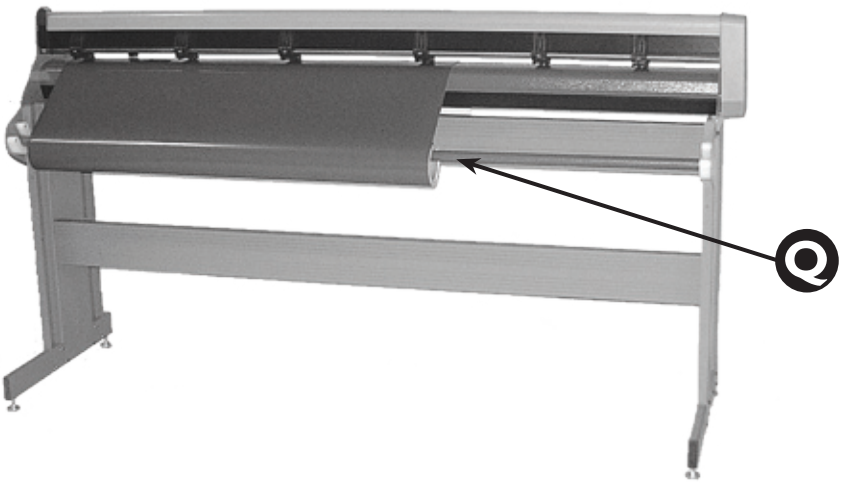


Figure 4. The Ioline SmarTrac Contour SC-72 cutter rear view.

Figure 5. Power and communications ports are located on the back of the right cover.

Chapter 1

Installation

Getting Started

Thank you for purchasing the Ioline SmarTrac signcutter.

This manual contains instructions and guidelines for setting up, operating and maintaining your signcutter. The SmarTrac hooks up to your system like a printer. Use design software to create your designs and send files to the SmarTrac for cutting or plotting. The following components are needed to cut designs:

- A Windows-compatible computer. The computer must be assembled and installed correctly before you connect it by serial or USB cable to the signcutter.
- Design software loaded into the computer according to the manufacturer's installation instructions. If you have any questions about the computer or the software, you will need to contact the manufacturer or your dealer. Most design software provides drivers for Ioline signcutters. If you need assistance with drivers, contact Ioline customer service.
- There is a specialized software program that comes with the signcutter called the Ioline **Control Center**. This software utility enables you to adjust signcutter settings and perform system diagnostics.
- The signcutter will cut the graphic exactly as you have designed it, from the material that you have loaded into the SmarTrac. *See table below for a list of compatible materials.*

Hint

If you use Windows® 98SE or later, you can connect the SmarTrac to your computer via USB. Use a serial connection for older operating systems or if your computer does not have a USB port.

Compatible Materials

SmarTrac I/S	SmarTrac Contour (SC)
Vinyl	**Vinyl**
Sandblast	**Sandblast**
Rubylith	**Rubylith**
Flock	**Flock**
Stencil	**Stencil**
Thin reflectives	**3M® 9600 & some other reflectives**

CAUTION

Do not lift the signcutter by the plastic end covers, the dust cover, or the carriage rail. This may permanently damage the machine. Use the bottom surfaces of the signcutter to lift or move it.

Installation

Unpack the Signcutter

This procedure requires two people. Carefully remove the signcutter from the box and place it on a flat, stable surface. Check the **Packing List** to ensure that all of the accessories are present. Save all packing materials and the box.

Assembly

Refer to the ***SmarTrac Quick Start Guide*** for directions on assembling the signcutter.

If you purchased the SmarTrac with a stand or table-top cradle, you'll find assembly directions and hardware in the **Accessory Kit**. Assemble and attach the stand or cradle to the signcutter before attempting to plot. Make sure the media rollers (media shaft on the SC-72) are properly installed and that the signcutter is facing the correct direction. Place a level on top of the signcutter and adjust the stand leveling feet as required to level the stand.

Prepare the Area

Prepare a large clean area to work. Make sure the floor is free of debris and clear of any obstacles. Pull the signcutter away from the wall so the material can move freely.

Connect the Signcutter to the Computer

Connect the SmarTrac to the computer with either a USB or serial cable. A serial cable is provided in the **Accessory Kit**. Standard USB cables are widely available at computer stores or from Ioline.

The SmarTrac has a 9-pin male serial port receptacle. If your computer has a 25-pin serial port, a 9- to 25-pin adapter is necessary. Adaptors are inexpensive and available from computer stores or from Ioline.

After the cables are correctly connected between the computer and signcutter, select the correct port within both the design software and the **Control Center**. Consult the design software manual or your dealer for further information. Consult the ***Operation*** chapter of this manual or contact Ioline Customer Service for assistance with the **Control Center**.

Note

The plotter will not function if a serial cable is connected to a parallel port on the PC.

Note

Always turn off the power to both the computer and the machine before connecting any cables. This will protect the equipment and reset the signcutter.

Note

Make sure power is off to the computer and the signcutter. Ioline recommends using a surge protector power strip for both machines.

Installing USB Drivers

Prepare to install

1. Make sure power to the Ioline equipment is off.
2. Connect the PC to the equipment with the USB cable.
3. Power on the PC.
4. Insert the included Ioline Installation CDROM into the PC CDROM drive.

Figure 6. USB Connection. (Unused serial port also shown above.)

Windows® XP Warning

A warning may appear during Windows® XP installation that the driver is not certified by Microsoft®. Please press the **Continue Anyway** button to continue with the installation.

Hardware Installation
The software you are installing for this hardware:
Ioline USB Composite Device
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

Figure 7. Ignore the Windows® XP Warning.

Install Drivers

1. Turn on power to the Ioline equipment.
2. The **Add New Hardware Wizard** window will appear. Click on *Next*.
3. Click in the circle next to ***Search for a suitable driver for my device*** then click ***Next***.
4. Click on ***Browse*** then find the **USB_Drivers** folder on the Ioline Installation CDROM. Click on ***Open***, then ***OK***.
5. A note will appear that the Wizard

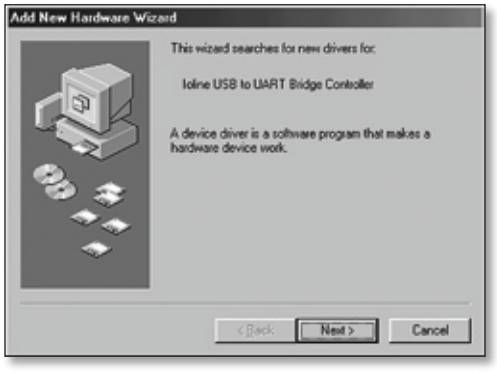

Add New Hardware Wizard
This wizard searches for new drivers for:
Ioline USB to UART Bridge Controller
A device driver is a software program that makes a hardware device work.
< Back
Next >
Cancel

Figure 8. Click Next when the **New Hardware Wizard** window appears.

Note

Ioline USB drivers are only compatible and tested with Microsoft Windows operating systems versions 98SE, 2000, and XP. They are not WHQL certified at this time.

Note

Ioline USB drivers create a special COM port that allows computer software with serial communication support to use the USB connection.

completed installing drivers for the Ioline **Composite Device**. Click the ***Finish*** button.

6. Some versions of Windows may repeat this process a second time for the Ioline USB to UART Bridge Controller. Click the Finish button.

Add New Hardware Wizard
Windows driver file search for the device:
Ioline USB Composite Device
Windows is now ready to install the best driver for this device. Click Back to select a different driver, or click Next to continue.
Location of driver:
D:\USB_DR~5\IOLBUS.INF
< Back
Next >
Cancel

Figure 9. Locate the USB driver folder.

Find the COM Port

1. Open the **Windows Control Panel**.
2. Double click on the ***System*** icon.
3. In Windows® 2000 and XP, click on the ***Hardware*** tab then ***Device Manager*** button. In Windows® 98SE, click on the ***Device Manager*** tab.
4. Double click on the ***Ports (COM and LPT)*** item to expand the list.

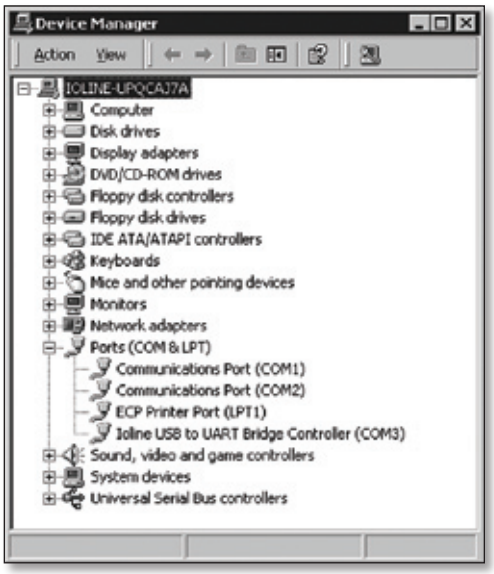


Figure 10. Find the COM port number under the **Device Manager** window.

5. Find the ***Ioline USB to UART Bridge Controller (COMx)*** item in the list. Write down the COM port number shown in the label. Use this information when configuring software that communicates with the equipment (*see below*).

Setup the Software to use USB

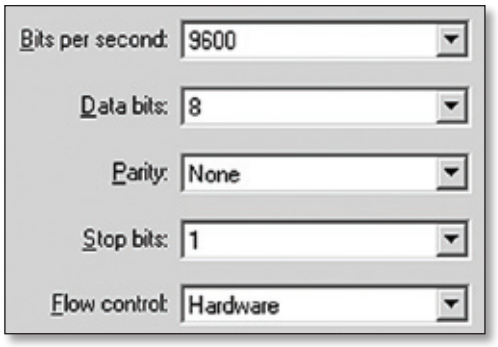


Figure 11. Setup the software for USB.

1. Install the application(s) that will send data to the machine. This includes utilities that are included with the equipment.
2. When configuring the driver and communications for the application, choose the COM port number determined above in ***Find the COM Port***.
3. If additional COM port settings are required, use the values shown in the **Figure 11**.

Manually configure the USB settings (optional)

1. Open the Windows Control Panel.
2. Double click on the System icon.
3. In Windows® 2000 and XP, click on the Hardware tab then **Device Manager** button. In Windows® 98SE, click on the **Device Manager** tab.
4. Double click on the ***Ports (COM and LPT)*** item to expand the list.
5. Right click on the ***Ioline USB to UART Bridge Controller (COMx)*** item in the list, then choose ***Properties***.
6. Click on the **Port Settings** tab and enter the values shown above in ***Setup The Software to Use USB***.
7. Click on ***OK*** when finished.

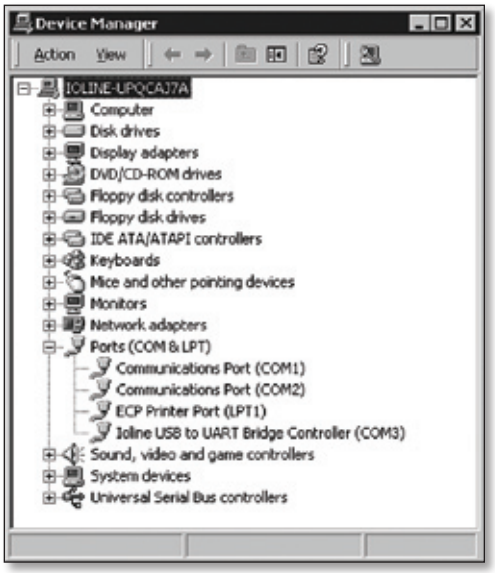


Figure 12. Enter the port settings under the **Device Manager** window.

Note

Manually changing the Windows® COM port settings is required for some programs. Use the **Windows® Device Manager** to change settings.

Note

Both USB and Serial communications use a COM port designation. See the ***SmarTrac Quick Start Guide*** for more information.If connected to a serial port, a COM port designation (i.e. COM 1, COM 2, etc.) must be selected.The choice of a port for the signcutter will depend on the ports being used by other devices on the computer. Consult with the dealer if a port is not available.

Power On

Turn on the computer and the signcutter to make sure they work. The signcutter power switch is located next to the power cord behind the keypad. The carriage will move toward the keypad side of the machine when the power is turned on. Keep hands and loose clothing away from all moving parts of the signcutter. The red LED on the front panel will light when the start-up process is finished.

Installing Ioline Software and Manuals

The **Control Center** is a utility that enables you to adjust parameters and optimize cutter performance. IQ Plot provides advanced production management. The SmarTrac comes with a CD-ROM which has the Microsoft Windows® 98SE, 2000 and XP version of the Ioline **Control Center** and IQ Plot programs, and electronic ***User Guides***.

1. Turn on the power to the computer and start Windows®.
2. Insert the Ioline CD ROM into the CD ROM drive (usually ***D:***)
3. Select the **Start** button.
4. Choose ***Run***.
5. Type ***D:\SETUP*** (substitute the correct letter if the CD ROM drive letter is not ***D:***) and Click ***OK***.
6. Follow the instructions that appear on the screen.
7. Consult the ***Operation*** chapter of this manual for details on using the Ioline **Control Center** software.

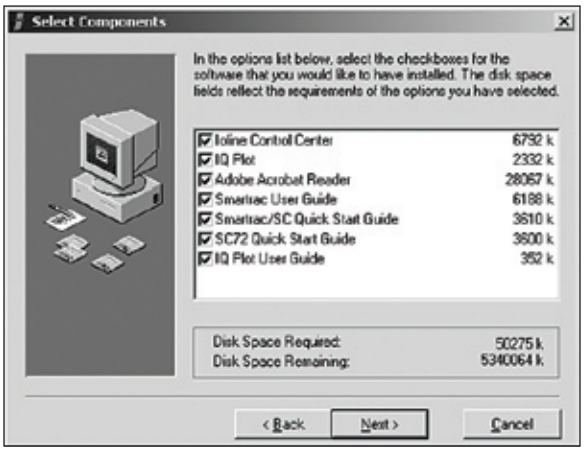

Select Components
In the options list below, select the checkboxes for the software that you would like to have installed. The disk space fields reflect the requirements of the options you have selected.
Ioline Control Center 6792 k
IQ Plot 2332 k
Adobe Acrobat Reader 28067 k
Smartrac User Guide 6188 k
Smartrac/SC Quick Start Guide 3610 k
SC72 Quick Start Guide 3600 k
IQ Plot User Guide 352 k
Disk Space Required: 50275 k
Disk Space Remaining: 5340064 k
< Back
Next >
Cancel

Figure 13. The Ioline **Control Center Installation** window.

CHAPTER 2

Operation

Keypad Controls

The keypad allows access to the main signcutter functions.

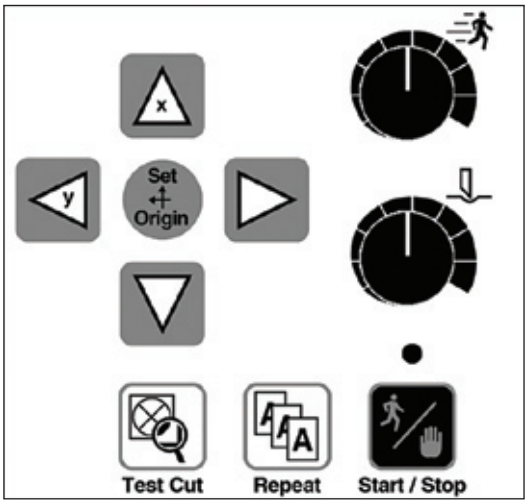


Figure 14. The SmarTrac keypad.

Note

Unless otherwise stated, the following information applies to both the I/S and SC SmarTrac lines.

START/STOP

The **START/STOP** key connects or disconnects communication between the computer and the signcutter. If the **START/STOP** key is pressed during cutting or plotting (**STOP** mode) the machine will stop when the current vector is finished.

The **Arrow** keys are active when in **STOP** mode. When the **START/STOP** key is pressed again, (**START** mode) cutting will resume exactly where it stopped.

START mode	Green light	**Arrow** keys inoperable, signcutter *online* (ready to receive instructions).
STOP mode	Red light	**Arrow** keys operable, signcutter *offline* (not ready to receive instructions).

Arrow Keys

Pressing the **Arrow** keys moves the material back and forth or the carriage from side to side. The **Arrow** keys will not work unless the signcutter is in **STOP** mode (*see* **START/STOP** *above*).

Set Origin

The **Set Origin** key sets the initial origin or starting position for the sign. Unless you use the **Repeat** function to cut the same graphic, it is best to set a new origin before cutting each sign. If a new origin is not set before sending a file to the signcutter, the signcutter will begin at the origin point set for the previous cut file.

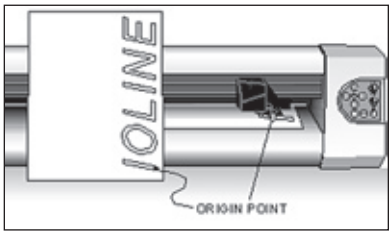


Figure 15. Origin point.

Note

Design software usually refers to the origin as "lower left" because it is the lower left corner of a sign. Because the cut is usually oriented as shown, it is physically on the right side of the signcutter.

Your design software may give you the option of selecting the origin point. If you set the origin within the software, but do not reset it on the signcutter using the **Set Origin** button, the SmarTrac will treat the new file as a continuation of the previous cut. This affects the **Repeat** function. (*See the **Repeat** section below.*)

To set a new origin, make sure the SmarTrac is in **STOP** mode (**Red** light is on). Use the **Arrow** keys to move the pen or blade to the intended origin of the cut, then press the **Set Origin** key. The signcutter will then be ready to accept cut/plot files.

Speed

Use the **Speed** knob on the front panel of the signcutter to adjust the speed. Turn the knob clockwise to increase the speed, or counterclockwise to decrease the speed. Set the speed according to the type of cutting and material being used. *See the **Cutting a Sign** section of this manual.*

Force

Adjust the force by using the **Force** knob on the front panel. Turn the **Force** knob clockwise to increase the force exerted on the pen or blade. *See the section on **Cutting a Sign** for the recommended settings.* The range of force available at the knob is adjustable in the **Control Center**. The maximum range is 1 to 500 grams (1 to 400 grams for the I/S 60).

Test Cut

The **Test Cut** button cuts a test pattern. Use it before cutting new material to help determine the proper force (for knives or pens) and blade exposure for cutting signs—and the effect of the blade offset and overcut settings specified in the **Control Center**. *See the section on **Cutting a Sign** for details on adjusting force and blade exposure.* The **Control Center** section has details about blade offset and overcut.

1. Make sure that material is loaded in the signcutter that the blade holder is installed in the carriage. Position the blade over the material near the right side of the signcutter.

CAUTION

Note: Using too much force can cause excessive drag, damage the pen or blade, or tear the material.

2. Check for the **Red** light. Press the **START/STOP** key if it is not on.
3. Press the **Test Cut** key for one second. The plotter will cut a small test pattern consisting of a circle within a square.
4. Adjust the force and blade exposure up or down with the **Force** knob and the blade foot. Repeat the test cut until the desired line quality is obtained. *See the section on **Cutting a Sign** for details on adjusting force and blade exposure.*
5. Successive test cuts automatically align to the left of the last test cut.
6. If the **Test Cut** key is pressed for three seconds the plotter will cut a 1.9 in. x 7.1 in. pattern.

Repeat

The SmarTrac nearly 1 megabyte of data in buffer memory so that you can use the **Repeat** key to create additional copies of a graphic without having to resend the file. The signcutter must be in **STOP** mode (red LED) in order to use the this key.

Since the SmarTrac begins cutting or plotting at the current blade location in **STOP** mode, reposition the blade or pen first (using the **Arrow** keys) before pressing the **Repeat** key.

Several issues affect the repeat function and the data stored in memory:

1. If the file exceeds the capacity of the buffer, the **Repeat** function is disabled.
2. Your graphic will remain in memory until you reset the origin, send another file, or update settings with the **Update Display** function. (**Update Display** is described later in this chapter.)

Note

If an origin is not set between files, two possible unintended results can occur: if the combined cuts do not exceed the buffer, **Repeat** will cause them all to be recut or, if the combined files exceed the buffer size, **Repeat** will be disabled.

The Ioline Control Center

The Ioline **Control Center** is a utility program that does three things:

- Allows adjustment of settings to tailor output from the computer.
- Sends completed cut files to the signcutter. (To make design changes to the file, you must use the design software.)
- Includes several diagnostic tests for troubleshooting.

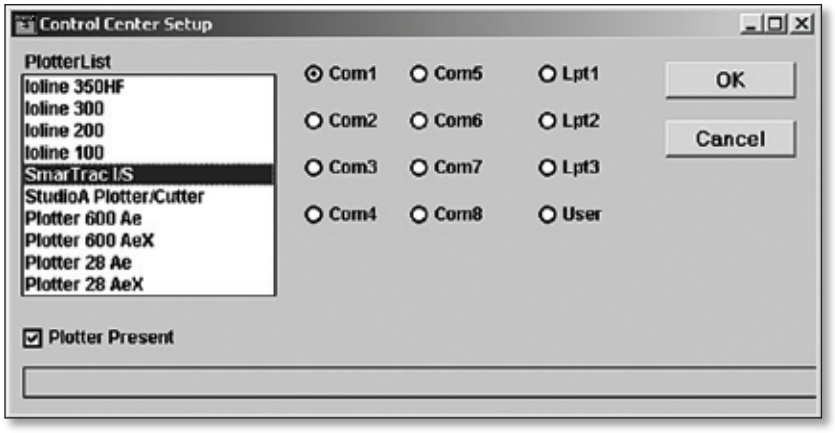


Figure 16. The **Control Center Setup Screen**.

Note

To avoid communication port conflicts, do not simultaneously run more than one application that is communicating with the plotter.

Note

The design software may override the **Control Center** settings. Check to see if it has by pressing the **Update Display** button before and after a cut is completed. If the settings change, use the design software to modify cutting parameters.

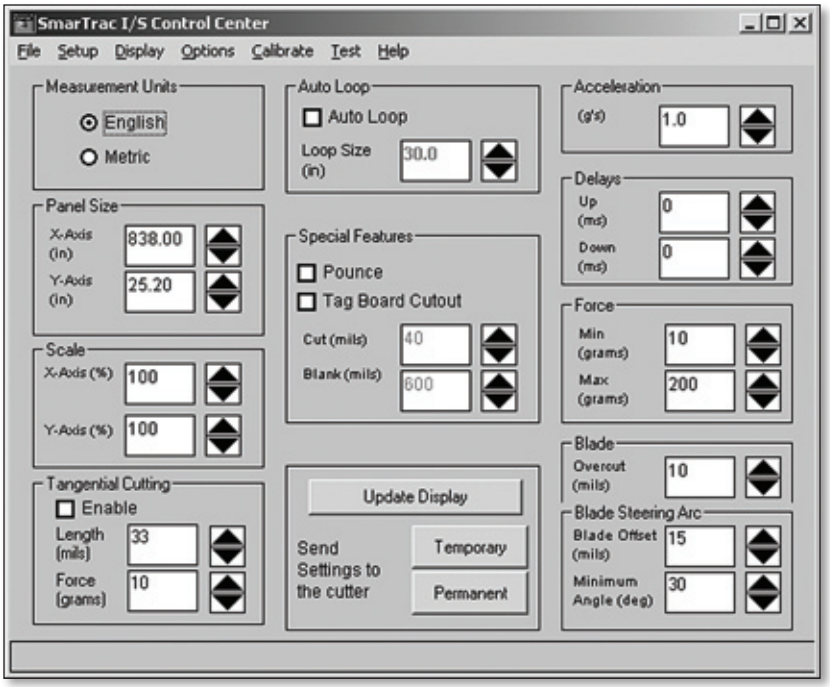


Figure 17. The **Control Center Main Menu**.

Changing System Settings

You can adjust many settings with the **Control Center** to fit your needs:

- Put the signcutter in **START** mode (**Green** light mode) before changing system settings. To do so, press the **START/STOP** key and make sure the **Green** light is on before changing any settings.
- The **Screen Menu** displays most commonly adjusted parameters. The **Menu Bar** contains utilities and less commonly adjusted signcutter settings.
- Your selected changes take effect only after you press one of the **Send Settings** buttons.

Menu Bar Features

The Ioline Control Center provides comprehensive help files to explain the functions of the software options. Below is a brief summary Menu Bar items.

File

Send Cut/Plot File	Sends a cut (***.PLT***) file to the signcutter.
Open Settings File	Restores saved settings files.
Save Settings As	Save settings files.
Exit	Exits the **Control Center** program.

Setup

Plotter Setup	Selects the correct signcutter model.
Port Setup	Selects the communications port.

Display

Plotter Settings	Displays current signcutter settings.
Factory Defaults	Restore original factory settings.
ROM Version	Displays installed ROM version.
Memory Buffer	Displays installed memory buffer size.
Blade Status	Displays whether or not the blade holder is installed.

Options

Filtering	Toggles Filtering on and off.
HPGL Setting	Selects an HGPL language.
Install New Firmware	Installs new firmware on the signcutter.

Calibrate

Calibrate Plotter	Calibrates the signcutter.

Test

Serial Test	Tests serial communications.
Computer Port Test	Tests the computer port.
Plotter Port Test	Tests the signcutter port.

Help

Contents	Lists contents of help files.
About	Provides **Control Center** version information.

Screen Menu Options

Measurement Units

English or Metric units are available when adjusting settings.

Panel Size

The **Panel Size** is the maximum area the signcutter can use for cutting. The factory-set (and maximum) X-axis panel length is 838-in long (2129-cm). The maximum Y-axis panel size depends on the machine width. The material moves along the X-axis; the carriage moves along the Y-axis. When cutting on a **Cut Sheet** the panel values should be adjusted to match the sheet size.

Scale

The factory-set **Scale** is 100%. The signcutter will produce a cut in the exact size of any cut file that is sent. If the scale is 50%, the signcutter will produce a cut that is half the intended size. The scale of the signcutter can range from 1% to 999%. Note: Both X- and Y-axes are set independently.

Autoloop

With **Autoloop** enabled the signcutter will create a service loop of material at the beginning of the plot and whenever necessary during the cutting process. The factory setting is 30-in (76.2-cm), but the loop size is adjustable. Disable **Autoloop** when cutting short pieces of vinyl or scraps.

CAUTION

Autoloop default is off. Do not allow the material to become taut when using a roll of material with **Autoloop** disabled. Manually create and maintain a service loop in the rear.

Tangential Cutting

When enabled, the tangential cutting feature will carefully align the blade with the line segment before making each cut in the material.

Settings:

Enable: Turns on the **Tangential Cutting** feature in the cutter after the **Permanent** button is pressed.

Length: Determines how far the alignment cut starts from the beginning of the line segment. The default of 33 is best for most materials.

Force: Sets the pressure used when making an alignment move. Ten grams typically makes little or no mark on the material but properly aligns the blade.

Special Features

See the sections, ***How to Pounce and Stencil Cutting****, for details on using these features.*

Pounce The **Pouncing** feature will make a series of holes for transferring a pattern to a flat surface. Special pounce tools are required. The hole size and spacing is adjustable. See Cut and Blank below for more details.

Tag Board Cutout **Tag Board Cutout** is for cutting stencil material (tag board). A standard blade holder and blade is required. An intermittent cut is created so that the stencil stays in place during cutting. *See **Cut** and **Blank** below for more details.*

Cut The **Cut** value is the length, in thousands of an inch (mils.), that the blade will cut when plotting the segmented line for pouncing or tag board cutout.

Cut Values

	Pouncing	Tag Board
Default Length	40 mils. (.04-in)	2000 mils.
Maximum Length	4000 mils.	5000 mils.
Minimum Length	40 mils.	50 mils.

Blank The Blank value is the length, in thousands of an inch (mils), that the blade skips (e.g. will not cut) when plotting the segmented line for pouncing or tag board cutout. The default length is 600 mils (.6 inches) for pouncing and 60 mils for tag board. The maximum is 4000 mils for pouncing and 5000 mils for tag board. The minimum is 40 mils for pouncing and 50 mils for tag board.

Blank Values

	Pouncing	Tag Board
Default Length	600 mils. (.6-in)	60 mils.
Maximum Length	4000 mils.	5000 mils.
Minimum Length	40 mils.	50 mils.

Note

The design software may override the **Control Center** settings. Check to see if it has by pressing the **Update Display** button before and after a cut is completed. Check the plotter setup screens in the design software to make adjustments if necessary.

Update Display

Selecting this option will update all of the screen values with the current settings stored in the signcutter. For example, using Update Display after a blade is inserted in the carriage will update the Control Center and allow access to the **Tag Board Cutout** parameters.

Send Settings to Cutter: Temporary

After changing any setting, the changes must be sent to the signcutter. If ***Send Settings to Cutter: Temporary*** is selected, all of the displayed settings will be used for the current session. When the signcutter is turned off these settings will be lost and the previous permanent settings will be in effect when the signcutter is turned on again. If any settings are changed, repeat the **Test Cut** procedure to ensure that the results are satisfactory.

Send Settings to Cutter: Permanent

If ***Send Settings to Cutter: Permanent*** is selected, all of the displayed settings will be sent to the signcutter and will be saved for all subsequent sessions, even after turning off the signcutter.

Acceleration

The factory-set **Acceleration** is 1.0 g. The **Acceleration** setting determines how quickly the pen or blade will reach full speed when starting or ending a cut line. Use the **Control Center** to change the setting within a range of 0.1 to 1.0 g. For long or difficult cuts, or when trying to achieve maximum accuracy, use lower **Acceleration** settings.

Up/Down Delays

The factory-set **Up** and **Down Delays** are both 0 milliseconds (ms) or 0 thousandths of a second. The **Delay** setting controls the amount of time, in milliseconds, the signcutter pauses after lifting or lowering the pen or blade. Under normal circumstances this setting will not require adjustment. Thick material (e.g. sandblast mask) may require a delay of 25 to 50 ms.

Force

The minimum and maximum force settings for the **Force** control knob on the keypad is adjustable.

Force Values

	Force Setting
Factory-set Default	10 grams
Default Maximum	200 grams
Maximum	400 grams
Default Minimum	10 grams

Blade Overcut

Blade Overcut is the distance the blade travels beyond the end of a cut. **Blade Overcut** ensures that each cut actually reaches the point where one cut line meets and slightly overlaps another cut line. This ensures that all of the pieces of the sign will be cut completely, with no undercuts. The factory-set **Blade Overcut** is 10 mils. This setting is ignored when a pen is installed in the carriage.

Blade Steering Arc

Blade Offset The **Blade Offset** is nominally 15 mils (or 47 mils on some blades), but specific blades can vary within a tolerance. For close work, making some tiny test cuts at several settings, then picking the best one, can improve accuracy. This setting is ignored when a pen is installed in the carriage.

Minimum Angle **Minimum Angle** sets the angle for the signcutter blade steering arc. For a very tiny cut, a small or zero angle can be specified. For larger cuts a greater angle of up to 45 degrees is best. The factory-set value works well with most files. Adjusting this setting for small cuts may improve performance. This setting is ignored when a pen is installed in the carriage.

Cutting a Sign

Before cutting a sign, turn the signcutter on, load it with vinyl, install a blade holder, and set an origin. (These steps are outlined below.) In most cases the design files are sent directly from the design software to the plotter. If necessary, use the Ioline **Control Center** software to send design files, adjust settings and test signcutter communication.

General Guidelines

1. Never let the material become suddenly taut between the plotter and a roll of material during plotting. A service loop of unrolled material is required for problem-free operation. Ioline recommends using the **Autoloop** function (enabled in the **Control Center**). It will create the required service loop by gently pulling a set amount of material from the roll before cutting. **Autoloop** default is off.
2. Use the **Paneling** feature in the design software for long signs. **Paneling** will restrict the length of any X-axis move. Ioline suggests an X panel size of 10 to 20 inches with no panels greater than 40 inches.
3. **Force.** Incorrect force can cause misalignment problems over the range of a long cut. If the force is too high, the material may skew.
4. Prepare a large clean area to work.

Power On

Turn on the computer and the signcutter. The signcutter power switch is located next to the power cord on the back. The carriage will move when the power comes on. Keep hands and loose clothing away from all moving parts of the SmarTrac. The **Red** light on the front panel will come on when the **Start-up Procedure** is finished.

Loading the Material

If using a roll of vinyl:

Place the roll between the media rollers (stand), on the axle (cradle or SC-72 stand) or at the back of the machine (foot).

If using a roll of paper:

Hang the paper roll on an axle if available. Use a media roller or the cradle tube if the signcutter has them. Place the roll behind the machine if the signcutter has only feet. Note: Do not place a paper roll between two media rollers.

If using a cut sheet or scrap:

Diable Autoloop.

Note

If **Autoloop** is not enabled in the **Control Center,** do not allow the material to become taut between the signcutter and the material roll. Manually create and maintain a service loop in the rear. See **Autoloop** in the Ioline **Control Center** section for more information.

Aligning the Material and Pinchwheels

Ioline recommends using the "Typewriter Method" to align the material to the platen. The drive shaft is optimized for most common material widths as well as scraps. When loading material, use the drive shaft markers on the traverse to find the drive shaft segments.

1. Lift the pinchwheels by raising the pinchwheel lever on the right side of the signcutter. Bring the material up and through the space under the pinchwheels. Pull down enough material to reach the media rollers on the stand (I/S 80, SC-40 and larger models) or about one foot (25-cm) on the table-top cradle-mounted I/S 60 models.
2. Roughly align the material so that the edges are overlapping the wide-right drive shaft segment and one of the smaller segments. Use the drive shaft markers on the traverse to find the drive shaft segments when they are covered by material.
3. Position the outer-pinchwheels on the material about 1-in (2.5-cm) from the edge. Use the drive shaft markers on the traverse as a guide to make sure the wheels are over a drive shaft segment.
4. Slide the inner-idler wheels (when provided) so that they are as close to evenly spaced between the outer wheels as possible while remaining over a drive shaft segment. Use the drive shaft markers on traverse to ensure that the wheels are positioned correctly.
5. With both hands, reach under the stand or cradle and clasp the front edges of the sides of the material hanging from the front of the machine against the edges of the material hanging from the back of the machine. Pull downward on the material and square the edges so that they are parallel front and back. Alternatively, align the edge of the material with the edge of the material roll.
6. While maintaining the material square and taut, clamp the pinchwheels to the material by lowering the pinchwheel lever on the right side of the signcutter.
7. Check alignment by using the **Arrow** keys to move the material forward and back. The material edge should run straight.

CAUTION

While checking alignment with the **Arrow** keys, make sure that the material between the material roll and the signcutter is never pulled taut with the drive shaft.

Adjusting the Pinchwheel Pressure

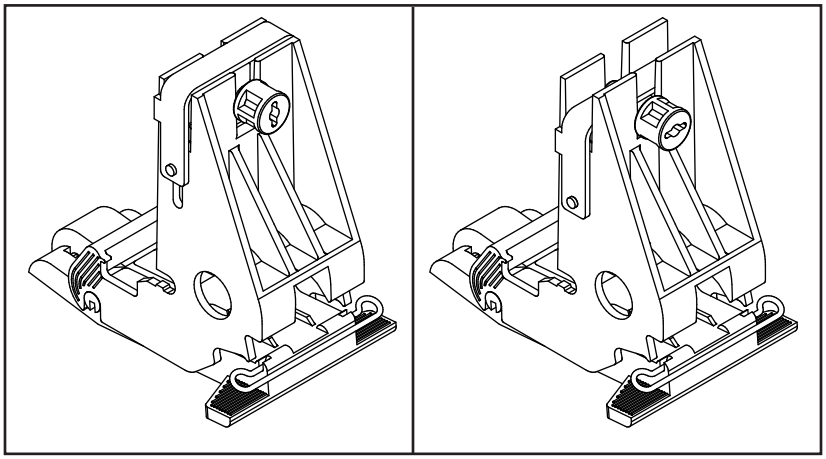
I/S 80, SC-40 and wider models have pinchwheels with adjustable spring force*. This allows the user to use maximum force (24 lbs.) for holding vinyl (which requires more force for better tracking) or less force (8 lbs.) for lightweight materials like paper and for sandblast resists that must be tracked directly on the rubber surface. The pinchwheels can also be set in a position that keeps them completely off the surface so that the inner pinchwheels on larger cutters will not interfere with pen plotting.

Set **Force Adjustment** by turning the screw on the back of the pinchwheel assembly.

1. Move the pinchwheel to the access hole on the back of the dust cover.
2. Insert a flat screwdriver into the slot and turn the adjustment screw 90 degrees. When the slot is in the vertical position on the outer wheels, the force is 24-lbs. The horizontal position indi-

*This option is not available on all SmarTrac models.

cates 8-lbs of force. On units equipped with inner pinchwheels, force can be set to 12 lbs. (vertical setting) or 4-lbs. (horizontal setting). The 12-lb. inner pinchwheel setting is useful for heavier materials such as heavy sandblast or reflective sheeting.



High Force Position
Cam Slot Vertical

Low Force Position
Cam Slot Horizontal

Figure 18. Adjusting pinchwheel presure.

Locking the Pinchwheels Off of the Platen

The idler pinchwheels have a locking feature* that will hold them off of the platen during cutting or plotting. This will reduce ink smearing if plotting with a heavy ink marker.

1. Lift the idler pinchwheels off the platen with the pinchwheel lever.
2. Press on the handles at the rear of the idler pinchwheel arm.
3. Flip the locking clip into position with both thumbs. Make sure that the clip is under the lower tabs.
4. When the pinchwheels are lowered onto the platen the idlers will stay in the up position.

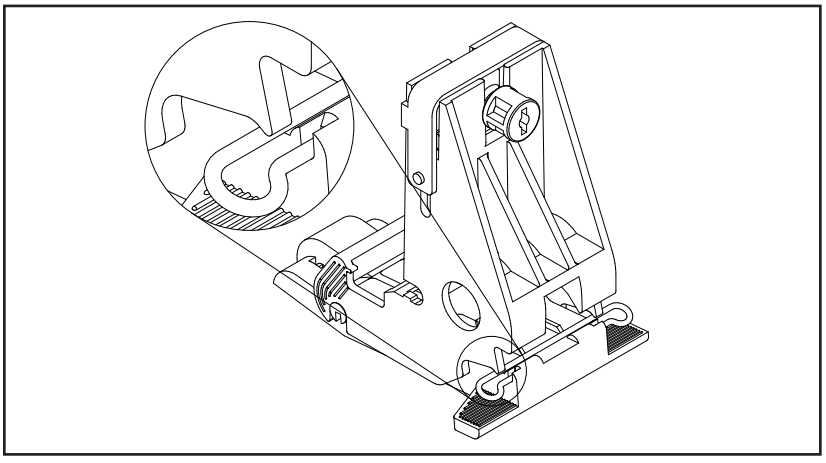


Figure 19. Locking the idler pinchwheels off the platen.

*This option is not available on all SmarTrac models.

Note

Be very careful when handling the blades as they are sharp and brittle and the tips can chip or break. Using a hard surface to insert the blade may damage it.

Installing a Blade and the Blade Foot

A blade and a blade holder are included in the **Accessory Kit**. To install the blade and blade foot in to the blade holder:

1. Remove the foot from the assembly by unscrewing it counter-clockwise.
2. Slide the blade into the hole in the blade holder until it bottoms out. The blade should spin freely.
3. Screw the foot clockwise onto the shank. Stop before the blade emerges.

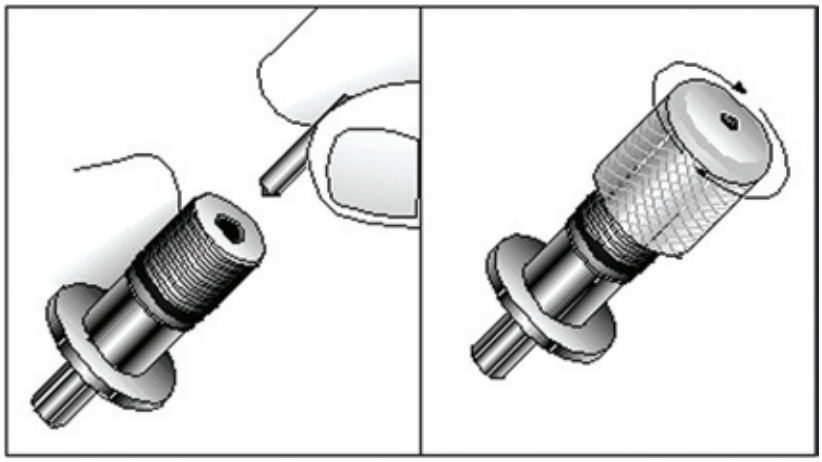


Figure 20. Installing the blade and blade foot in the holder.

Installing a Blade Holder or Pen

1. Rotate the clamp out of the way, then turn the clamp screw until there is enough room to insert the blade holder or pen.
2. If using a blade holder or plotter pen, slip the flange into the slot in the carriage jaw. If using a regular pen, position the tip $^{1}/_{10}$-inch off of the platen when the jaw is in the up position. The signcutter can hold any pen with a maximum barrel diameter of $^{7}/_{8}$-in (22-mm).
3. Tighten the clamp screw until the blade or pen is secure.

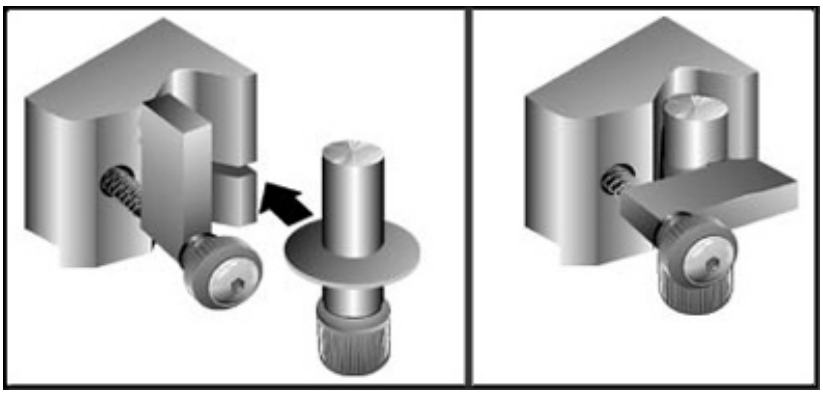


Figure 21. Installing the blade holder in the carriage jaw.

Adjusting Blade Exposure and Force

Properly adjust blade exposure and force to achieve good cutting results.

Adjusting Blade Exposure:

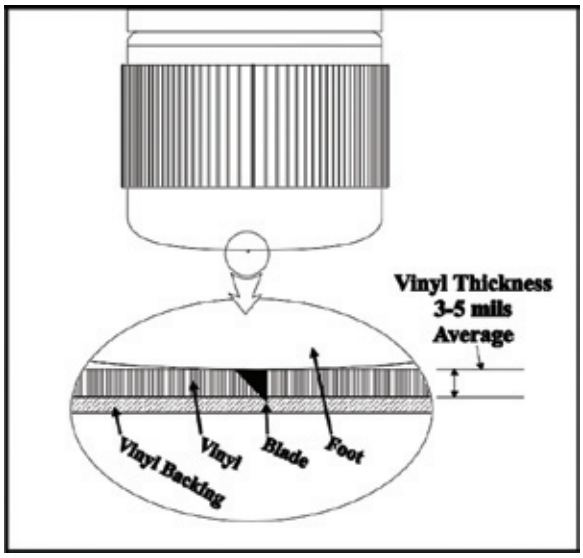


Figure 22. When properly exposed, the blade lightly scores the backing.

1. Turn the **Force** knob clockwise to maximum. Set the **Speed** to 50% with the keypad knob. The maximum force setting is adjustable in the **Control Center** to 500 grams (400 grams for the I/S 60), if required for thick materials. A maximum force of 200 grams is sufficient for most materials.
2. Check that the blade tip is barely visible when viewing the blade from the side. This technique approaches the correct blade exposure from too little with no chance of having too much (which could damage the blade).
3. Press the **START/STOP** button on the front panel until the LED is red. Move the carriage until the blade is near the right edge of the material.
4. Press the **Test Cut** key for one second. The signcutter will cut a test sign. There will be no cutting if the initial foot adjustment was correct.
5. Turn the foot $^{1}/_{8}$-turn upward (clockwise from below). Press the **Test Cut** key. The material should have a light pattern.
6. Continue increasing the blade exposure and making test cuts. The test sign will completely separate from the surrounding material and lightly score the material backing when enough blade is exposed.

Note

Successive test cuts will automatically be positioned to the left of the previous test cut.

Force Adjustment:

Different types of materials require a different cutting force. Before adjusting **Force**, make sure that the blade exposure is adjusted first. *See **Adjusting Blade Exposure**, above.*

1. Turn the **Force** knob down slightly from maximum, about one mark, and repeat the **Test Cut**. Use **Full Force** if the **Test Cut** is not complete.
2. If the **Test Cut** is complete, turn the **Force** down again and repeat the **Test Cut**. Continue until the cut is incomplete. This indicates that there is not enough force to push the exposed blade fully into the material. At this point turn the **Force** knob up one mark, which should be just enough.

Verification:

1. Press the **Test Cut** key for 3 seconds. The signcutter will cut a 1.9 inch x 7.1 inch design.
2. If the sign does not separate cleanly and leave a light scoring on the backing, try another 1/8 turn upward (counter clockwise from above) of blade exposure and a very slight increase in force.

Sending a Cut/Plot File to the Signcutter

Always load the signcutter and make test cuts to determine the correct settings before sending any files. *See the **Adjusting Blade Exposure** and **Force** sections for more details.*

Important: Make sure that the carriage and material are in the proper position and that an origin is set by pressing *Set Origin* on the keypad (LED is green).

Send the file directly from the design software following the directions in the documentation or—

From the Ioline **Control Center**:

1. From the menu bar select ***File*, *Send Cut/Plot File***.
2. Either enter the path and file name of the cut or select the correct location from the directory\file lists in the dialog box. For example, the path might be:

   C:\IOLINE\<filename>.plt

4. Select **OK**.

Pausing Cutting

1. Press the **START/STOP** key to place the signcutter in STOP mode (red LED).
2. When cutting is interrupted, the carriage and material can be moved with the keypad **Arrow** keys.
3. Press the **START/STOP** key to resume cutting. The signcutter will return to the original cutting position and continue plotting where it stopped. The keypad LED will change from red to green.

CAUTION

Do not turn the material roll or pull material tight between the drive shaft and the material roll while cutting is paused. If the material becomes suddenly tight, the machine will jam.

Canceling a Cut

1. Press the **START/STOP** key to place the signcutter in **STOP** mode (red LED).
2. Cancel the cut from the design software (refer to the design software manual or consult software dealer) or cancel the cut in the **Control Center** software by clicking on the **Abort** button in the **Send File** window. (Note: If this step is skipped the cut will continue when a new origin is set.)
3. Press the **Set Origin** key to make the signcutter delete the cut data it has already received but has not yet plotted.

Suggested Settings

There are many variables that determine signcutter output quality. Ioline recommends using low force and speed settings when making the initial test cuts. Gradually increase these settings until the best values for the material are found. Refer to **Figure 23** for settings for a variety of material types. **Force** values are provided for starting reference only. These settings may vary due to manufacturer, color, age, and temperature of the material.

Guidelines for Plotting Pens

Ioline has determined guidelines for plotting with a plotter pen. Refer to the **Figure 24** for recommended settings for a variety of pen

Material	Thick-ness (mils)	Blade	Offset (mils)	Force[2] (grams)	Speed (ips)	Accel-eration (grams)	Min. Angle (degrees)	Overcut (mils)	Down Delay (millisecs)
Amberlith™ / Rubylith™	1	45°	15	30-60	med.	0.1	30°	0-5	0-50
Flock	15	Cobra	47	100-200	min.	1	15°	10	0
Polyester, Metalized	2	45°	15	100-140	max.	1	30°	10	0
Reflective, Engineering Grade	5	45°	15	240-250	min.	1	30°	10	0
Sandblast Mask2	18[1]	-	-	-	-	-	-	-	-
	3[1]	Cobra	47	220-260	min.	1	15°	30	0
	36	Cobra	47	220-260	min.	1	15°	30	0
	40[1]	-	-	-	-	-	-	-	-
Stencil, Lacquer Adhering	1	45°	15	80-100	max.	1	30°	10	0
Stencil, Vinyl	4	45°	15	200-220	min.	1	30°	10	0
Stencil, Water Soluble	1	45°	15	125-135	med.	1	30°	10	0
Tag Board	10	45°	15	300-400	min.	0.1	30°	10	0
Vinyl, Calendered	3	45°	15	100-150	med.-max.	1	30°	10	0
Vinyl, Cast	2	45°	15	100-150	med.-max.	1	30°	10	0

1 These sandblasts typically have a backing which is designed for cutting by hand.

2 Use the low force setting on the pinchwheels if using a 80 cm or larger plotter.

NOTE:

Settings should be adjusted for cutting small letters or intricate detail, refer to the Cutting Small Characters section.

Figure 23. Suggested settings for different materials.

Paper	Pen	Speed	Force (grams)	Comments
BMI® Super Layflat or equivalent high-quality bond	HP®-style ballpoint	Maximum	60 – 80	1 5ms pen up/ 1 5ms pen down delays
"	BIC® Round Stic ballpoint	Maximum	180 – 200	
"	Standford® Sharpie	Maximum	70 – 100	
"	HP®-style fiber tip	Maximum	70 – 100	
—	Plastic tip	—	—	Not recommended
—	Ceramic tip	—	—	Not recommended
—	Liquid ink / Metal tip	—	—	Not recommended

Figure 24. Plotting pen guidelines.

types. Use **Test Cut** and gradually increase these settings until the best value is found for the pen being used. Remember that **Force** values are for starting reference only. These settings may vary due to manufacturer, color, age, and temperature of the material.

Cutting Long Signs

When cutting long signs, it becomes increasingly important for the material to be aligned properly and for the settings to be properly adjusted. Before cutting, verify that the SmarTrac is properly calibrated and that the pinchwheels are correctly spaced. For best results, certain system settings should also be adjusted. Use the Ioline **Control Center** to make these changes. The following suggestions will help you produce fine quality long signs.

1. Use a stand or cradle. The use of a stand or cradle takes advantage of the signcutter platen design. When draped over the platen, the material benefits from its natural tendency to curl downward.
2. Build a material slide. Cut two cardboard pieces the width of the stand and large enough to lean against the stand legs. This prevents the material from going under the machine and getting buckled with material from the other side.
3. Check the material roll. Place the roll of material to the right of the material cradle or media rollers. Make sure the roll is tightly wrapped and even along the sides.
4. Load the material straight. *See the previous sections **Loading the Material** and **Aligning the Material and Pinchwheels** to properly load the signcutter.*
5. Lower **Acceleration**. Using the Ioline **Control Center**, set **Acceleration** to ***0.5 g*** or less. Lower acceleration will help with overall accuracy, especially in the transition between **Frames**.

6. Use **Autoloop**. **Autoloop** will gently pull a set amount of material from the roll. This helps the material feed into the signcutter more accurately and keeps it from "jerking" from the roll. **Autoloop** also helps to set up the drive track in the backing of the material, which helps keep the material aligned. **Autoloop** is enabled in the **Control Center**. Set **Autoloop** to ***ON*** and set the **Loop Size** to the default of ***30 inches***. Setting the **Panel Size** in the signmaking software to the same length as the **Loop Size** might help tracking accuracy. If **Autoloop** is ***OFF***, maintain a service loop of material behind the signcutter to prevent, "jerking," material from the roll.
7. **Speed**. Set the **Speed** knob to ***50 percent or less***. Moving the material at a slower speed helps to keep it more stable and prevents it from kinking or buckling.
8. **Force** and **Blade Depth**. Incorrect cutting **Force** and **Blade Depth** can cause misalignment problems over the range of a long plot. If the **Force** is too high, the material may skew. If the **Blade Depth** is set too deep, it could cut all the way through the material and/or cause the material to become jammed under the blade.
9. Let the software help. Use the **Automatic Sorting, Ordering or Contour Ordering** feature in the design software (some software programs automatically handle this process). This will reduce the number of time consuming back and forth and side to side movements. Wear on the material backing (as well as the vinyl) is also decreased, which will improve tracking. The more complex the file, the more difficult the problem.
10. Use the **Paneling** feature in the design software. **Paneling** will restrict the length of any X-axis move. Ioline suggests a **Panel Size** of ***10*** to ***20 inches***. With most signmaking software, the **Paneling** feature allows the placement of a panel between characters.

Cutting Small Characters (Under $^{1}/_{4}$-in.)

For cutting small characters or intricate detail in various material, it is necessary for the signcutter to be calibrated properly and to make sure the pinchwheels are spaced correctly. Also, some of the system settings should be adjusted to achieve more accurate detailed cutting. This is done by making changes in the Ioline **Control Center** and by adjusting the dial controls on the front panel. The following is a list of adjustments that should be made:

1. Lower **Force**. The lowest blade force possible is the best for small, detailed cutting. Start by making test cuts with ***one quarter*** **Force**. Gradually increase the **Force** until the vinyl is completely cut.
2. Slower **Speed**. The **Speed** knob should be set halfway or less.
3. **Foot Adjustment**. After setting the lowest cutting **Force**, adjust the **Foot** downward until the cut is not complete, then back it up just enough to get a complete cut. Since some **Force** is applied to the **Foot**, a slight increase in cutting force might be necessary. When the **Foot** is adjusted properly, the blade tip should just cut through the material.

4. Lower **Acceleration**. When cutting Rubylith or Amberlith, set the **Acceleration** to ***0.1 g*** in the **Control Center**. Set the **Acceleration** to ***0.5g*** for all other material.
5. **Minimum Angle**. This is listed in the **Control Center** under the **Blade Steering Arc** heading. The **Minimum Angle** should be set at ***0 degrees***.
6. **Overcut**. Set this between ***0-5 mils***. If weeding becomes difficult at corners, increase **Overcut** by one mil at a time until weeding is easier. A little more force might help if the material has incomplete cutting not at the corners.
7. **Offset**. Usually the offset listed for the blade is used as the **Offset** in the **Control Center**. For very small characters, tiny manufacturing variances among blades can make a difference. Check this by cutting small characters with sharp turns, i.e. the letter ***N***. With the standard 45 degree, .015 inch offset blade, try several tests using different offset values, i.e. 13, 14, 15, 16, and 17 mils, then pick the value with the best result.
8. **Position the Wheels**. Place the pinchwheels near the cutting area to assure that the vinyl stays flat.

How to Pounce

Use the pounce feature with high quality paper. Ioline recommends 20 lb. paper that lies flat. A pounce tool and a pounce blade (available from Ioline) are also required.

1. Select **Pounce** in the Ioline **Control Center**. Make sure that **Tag Board Cutout** is turned *OFF*. Put the signcutter in **START** mode (green LED on). Update the signcutter with the **Send Settings** (temporary or permanent) buttons.
2. Slide the paper roll onto a media roller (use the roller as an axle). Ioline does not recommend using two media rollers to cradle paper rolls.
3. Enable **Autoloop** or create a service loop of material.
4. Set the **Speed** knob to maximum. Set the **Acceleration** to ***0.5 g***. Performance will vary with different paper types. Experiment with lower settings if required.
5. Turn the **Force** knob to maximum (default is 200 grams).
6. Install the pounce tool and blade like a standard blade holder. (Note: there is no foot on the pounce blade assembly.)
7. With the **Red** light ON, press the **Test Cut** key for 3 seconds. The signcutter will pounce a 1.9 inch x 7.1 inch design.
8. Increase or decrease the force on the **Force** Knob as needed for a complete puncture through the paper. If the pounce blade picks up the paper and jams, try setting the **Force** and/or **Acceleration** to lower settings.
9. The **Pouncing Cut** is intermittent - short pounce cut followed by a longer uncut segment. The default length is 40 mils (.04 inches) for the cut and 600 mils (.6 inches) for the blank. The lengths of the cuts and blanks are adjustable with the **Control Center**. Perform test cuts to determine the proper settings for these parameters. (E.g., try wider blank spacing for larger im-

ages.) *See the section describing the **Ioline Control Center** for more details on adjusting the cut and blank settings.*

Stencil Cutting

Stencil material (Tag Board) is handled much the same as vinyl with the important exception of using much higher force.

1. Select **Tag Board Cutout** in the Ioline **Control Center**. Make sure that **Pounce** is turned off. Put the signcutter in **START** mode (green LED on). Update the signcutter with the **Send Settings** (temporary or permanent) buttons.
2. Slide the paper roll onto a media roller (use the roller as an axle). Ioline does not recommend using two media rollers to cradle tag board rolls.
3. Enable **Autoloop** or create a service loop of material.
4. Install a blade holder in the carriage.
5. Perform test cuts to establish blade exposure and **Force** settings. *See the section **Adjusting Blade Exposure and Force** for the proper procedure.* Most tag board cuts are made at or near maximum force (400 grams). Check the **Control Center** for the maximum force setting. Adjust as necessary. *See the Suggested Settings in **Figure 23** for more details.*
6. A **Tag Board Cut** is intermittent - a long cut length followed by a short uncut segment. The default length is 2000 mils (2.0 inches) for the cut and 60 mils (.06 inches) for the blank. The lengths of the cuts and blanks are adjustable with the **Control Center**. Perform test cuts to determine the proper settings for these parameters. *See the section describing the **Ioline Control Center** for more details on adjusting the cut and blank settings*.

Tangential Cutting

This feature is available only on SmarTrac SC models and I/S 85, 100 and 130 models manufactured after March 2005.

When enabled, the tangential cutting feature will carefully align the blade with the line segment before making each cut in the material. This process is useful for especially challenging materials like reflective vinyl. Using tangential cutting will reduce throughput because of the extra alignment steps. Use the Ioline **Control Center** software to enable and adjust tangential cutting.

Follow these steps to enable tangential cutting:

1. Power on the Ioline cutter.
2. Use the **Arrow** keys to position the blade and material where cutting should begin. Press the **Set Origin** button on the keypad so that the keypad light turns green.
3. Open the Ioline **Control Center** software.
4. Find the **Tangential Cutting** box on the main screen.
5. Check the box next to **Enable**. Press ***Permanent*** in the **Send Settings to Cutter** window.
6. Perform a test cut on the machine. *See **Cutting a Sign** earlier in this chapter to learn about test cuts.*
7. Adjust parameters as necessary. The settings are explained below. Make sure to press **Start/Stop** until the keypad LED is green before updating settings in the cutter with the **Permanent** button.
8. The cutter is ready to make tangential cuts. Open the **Control Center** software and uncheck the **Enable** box then press the **Permanent** button to return to normal cutting mode.

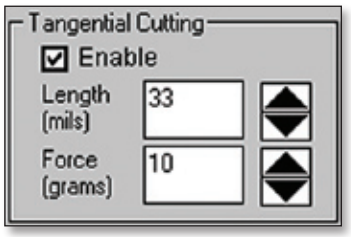


Figure 25. The Tangential Panel.

Contour Cutting

This feature is available only on SmarTrac Contour (SC) models and retrofitted I/S 85 models.

The contour cut feature provides an automatic registration process that, when combined with contour cut enabled design software, will read registration marks on a pre-printed image, send the position data to the software, then receive an 'adjusted' plot file that precisely cuts around the image. The registration and adjustment process is required because the color printing and/or laminating process may distort the media, especially when heat is used to cure the ink or apply films. These processes cause the image to expand and contract and might affect accuracy.

The following conditions are required for successful registration cutting with an Ioline SmarTrac Contour cutter:

1. The background material is white.
2. Four registration marks are printed in the corners of an encompassing rectangle around the pre-printed image(s). In other words, the marks form the corners of a rectangle that encloses, and is at least 1-in bigger on all sides than, the maximum dimensions of the printed image(s). *See **Figure 26**.*

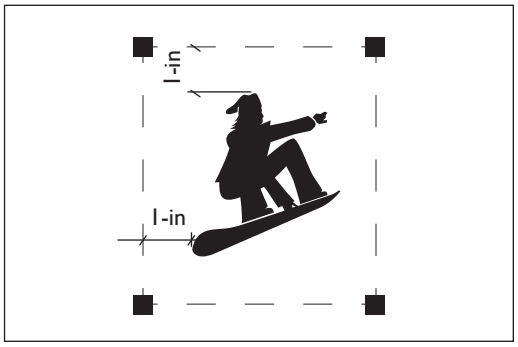


Figure 26. Rectangular registration marks.

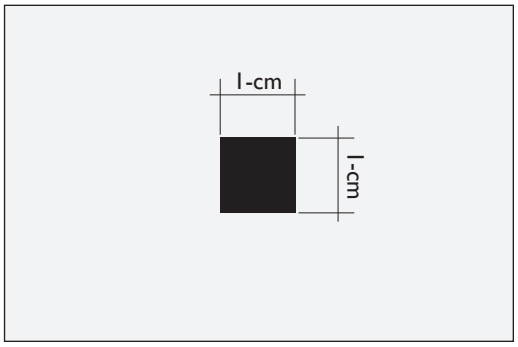


Figure 27. Ioline recommends registration mark dimensions of 0.394-in (1-cm) square.

3. The registration marks are solid rectangular black squares with a minimum size of 0.275-in. (7-mm) and a maximum size of .59 in. (15 mm). Ioline recommends a 0.394-in. (1-cm) square. *See **Figure 27**.*
4. Make sure there is a minimum margin of 3-in. between the registration marks and the edge of the vinyl on both sides and the top and bottom. *See **Figure 28**.*

Note

If using a pen for testing, recalibrate the sensor by following the calibration process described in this ***User Guide***.

5. The design software was used to create the registration marks, is capable of initiating registration process for Ioline cutters, and can adjust the cut file using the registration measurements made by the cutter. Contact the manufacturer of the design software to determine if Ioline contour drivers are available.

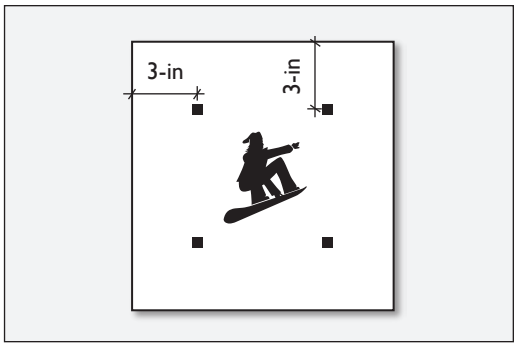


Figure 28. There should be a 3-in margin between the registration marks and the edge of the vinyl.

6. An origin point should be set on the cutter so that the sensor light is positioned within the center of the first registration mark. *See **Figure 29** before scanning begins. See **Set Origin** earlier in this chapter to learn the steps for setting an origin point with the keypad.*

7. The sensor is calibrated for the tool installed in the carriage. The cutter is calibrated for the blade holder at the factory.

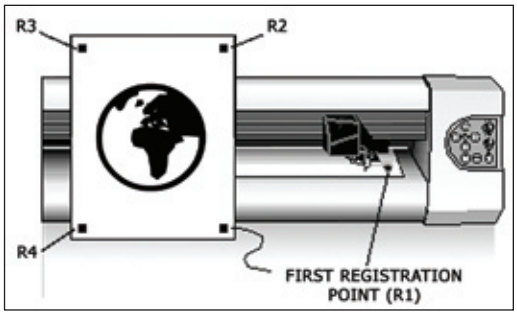


Figure 29. Registration mark locations on plot.

Procedure:

1. Load the pre-printed material into the cutter and verify that material movement is as straight as possible.
2. Center the sensor light over the first registration point and press the **Set Origin** key on the keypad. The first registration point (***R1***) is nearest the right end of the cutter and the front edge of the material. See ***Figure 29***.
3. Use the design software to begin the registration process. The cutter will automatically scan all four registration marks and send the measurements back to the design software.
4. The design software will adjust the cut output to the image then send the Ioline formatted file to the cutter.

CHAPTER 3

Communication Testing

There are three communication diagnostic tests available in the **Control Center**. These tests are designed to help determine if a communication problem exists and to isolate where the problem is occurring.

A diagnostic module is required to run two of these tests. It will work on both the computer and signcutter serial (COM) ports. It is available from Ioline or an authorized dealer.

Communication Test

This test will determine if communication is working between the computer and the plotter on the parallel (LPT) or serial (COM) ports. Run this test from the **Control Center**, **Test Menu**. The diagnostic module is not required to run this test.

1. Turn the plotter off. Connect the plotter to the computer with either a serial or parallel port cable. *See the section **Connect the Signcutter to the Computer** in the **Installation** chapter for more details.*
2. Start the Ioline **Control Center**. Select ***Test, Communication Test*** from the menu bar at the top of the window.
3. Turn on the signcutter while holding down the **Test Cut** key on the keypad. Hold down the **Test Cut key** until the signcutter beeps and the light flashes three times. The signcutter is now in **Test Mode**.
4. If testing the serial (COM) port, press the **START/STOP** key on the signcutter and verify that the handshake line (CTS) status displayed on the computer screen toggles ON/OFF. Leave the handshake line ***ON***. This is not necessary for the parallel (LPT) port.
5. Press the **Repeat** key to switch the signcutter into **Echo Mode**. The **Green** light will come on.
6. Press a key on the computer and verify that the character transmitted equals the character received. If the characters match then the connection between the signcutter and computer is working properly.
7. Select ***Exit*** after the communication test is complete.
8. Turn off the signcutter at the end of the test to exit **Test Mode**.
9. The next two tests are not necessary if serial (COM) port testing is successful.

Testing the Signcutter Serial Port

The diagnostic module is required for this test.

1. Connect the diagnostic module directly to the signcutter COM port.
2. From the **Control Center** main menu, select ***Test, Plotter Port Test***.
3. Turn on the signcutter while holding down the **Test Cut** key on the keypad. Hold down the **Test Cut** key until the signcutter beeps and the light flashes three times. The signcutter is now in T**est Mode**.
4. Press any **Arrow** key on the keypad to transmit and receive characters. Verify that the signcutter beeps.
5. Turn off the signcutter at the end of the tes to exit **Test Mode**. If this test fails, the signcutter port is faulty.

Testing the Computer Serial Port

The diagnostic module is required for this test.

1. Connect the diagnostic module directly to the COM port on the computer. If the computer COM port has a nine pin connector, use a 9-pin to 25-pin adapter between the COM port and diagnostic module.
2. From the **Control Center** main menu, select ***Test, Computer Port Test***.
3. Verify that the COM port selected is the correct one. If it is not, select the proper COM Port.
4. Verify the CTS handshake line is on.
5. Press any key on the computer keyboard and verify that the character transmitted equals the character received.
6. Select the **Exit** button at the end of the test to exit **Test Mode**. If this test fails, the computer port is faulty.

Chapter 4

Troubleshooting

If the system is not working correctly the problem could be with the computer, the cable, the design software, or with the signcutter. Changes to the computer operating system or the installation of new peripherals or software might cause conflicts. If the computer or the design software cause a problem, consult the computer or software manuals or call the manufacturer or dealer.

If the problem is with the signcutter, begin by making sure power is on and that the cable between the machines is connected correctly. Test the connection with the methods described in the ***Communication Testing*** section. Consult the following chart for more detailed troubleshooting techniques:

Troubleshooting Chart

The plot does not start at the correct point on the material.	
Cause:	**Solution:**
1. You have not set an origin.	1. Select an origin.
2. The origin selected in your software is different than the one you selected on your plotter.	2. Select origins in the software and on the plotter that coincide (usually lower-left, which is the right side of the plotter. *See* ***Figure 4***.)
The plot does not repeat when pressing the Repeat key.	
Cause:	**Solution:**
1. Buffer overflow: file size exceeds buffer size.	1. *See* ***Repeat*** *under the* ***Operation*** *chapter.*
When a plot is sent, nothing happens.	
Cause:	**Solution:**
1. The SmarTrac is in **STOP** mode.	1. Press the **START/STOP** key on the keypad to put the SmarTrac in **START** mode.
2. You forgot to set an origin.	2. Use the **Arrow** keys to position the blade and press **Set Origin** on the keypad.
3. There is a communications problem.	3. *See* ***Communication Testing*** and perform diagnostic tests. Contact your dealer if the problem persists.

Printing or cutting is erratic.	
Cause:	**Solution:**
1. The wrong plotter language is assigned to the plot file.	1. Make sure the correct driver setting is selected (HPGL or DM/PL).
The blade skips or tears the material.	
Cause:	**Solution:**
1. The blade is dirty.	1. Clean or replace the blade.
2. **Blade Force** is too low.	2. Increase **Blade Force**.
3. The blade is dull or broken.	3. Replace the blade.
The corners of the plot or cuts do not completely meet.	
Cause:	**Solution:**
1. The material is slipping.	1. Clean the drive shaft.
2. The blade is dull or broken.	2. Replace the blade.
3. The **Blade Overcut** is too low.	3. Use a higher **Blade Overcut** value.
4 The **Blade Offset** is incorrect.	4 See the ***Blade Offset*** section.
The design does not weed cleanly.	
Cause:	**Solution:**
1. **Blade Force** is too low.	1. Increase **Blade Force**.
2. The blade is dull or broken.	2. Replace the blade.
3. The **Blade Overcut** is too low.	3. Use a higher **Blade Overcut** value.
4. The **Offset** is incorrect.	4. See the ***Blade Offset*** section.
Poor tracking.	
Cause:	**Solution:**
1. **Pinchwheels are positioned over a bearing (e.g. a smooth section) of the drive shaft**.	1. Reposition the pinchwheels. over a drive shaft tread (located under the white drive shaft markers).
2. **Blade Force** is too high.	2. Reduce the **Blade Force**.
3. **Acceleration** is set too high.	3. Set **Acceleration** to ***.5g.***
4. **Speed** is set too high.	4. Reduce ***Speed*** to 50% or less.
5. The material kinks as it accumulates in the front or rear of the plotter.	5. Make sure the material remains smooth, flat and square during loading. Clear the media path in the front and rear of the SmarTrac.
6. The drive shaft is dirty.	6. Clean the drive shaft.

LED Codes

The Green light on the front panel blinks once:	
Cause: 1. The carriage is jammed	**Solution:** 1. Turn the SmarTrac off and clear away any debris or jammed material.
The Red light on the front panel blinks once:	
Cause: 1. The drive shaft is jammed.	**Solution:** 1. Turn the SmarTrac off and clear away any debris of jammed material.
The Red light on the front panel blinks twice:	
Cause: 1. Buffer overflow or communication problem.	**Solution:** 1. *See **Communication Testing*** and perform diagnostic tests. Call your dealer if the problem persists.
The Red and Green lights on the front panel blink intermittently:	
Cause: 1. Plotter language syntax error. 2. Bad or corrupted file.	**Solution:** 1. Make sure the correct driver is selected. 2. Restore the file from backup or recreate it.

Note

If any yellow lights blink on the keypad, make note of the number of times the light blinks and contact Ioline Customer Service immediately. Contact information is located in the ***End Notes*** chapter.

Note

If other lights are visible, contact Ioline Customer Service.

Troubleshooting the Parallel Port (for older machines)

If the computer communicates with the signcutter over a network, it is common for LPT 1 to be 'captured', meaning, the data is redirected to the network instead of flowing out of the parallel port on the back of the computer. Ending the capture will allow data to flow normally from the computer to the plotter.

1. Click the **START** button, select **Settings** and then click ***Printers*** to open the **Printers** window.
2. Right Click the printer icon for a network printer and select ***Properties***.
3. Click on the ***Capture Settings*** or ***Details*** tab.
4. Click on ***End Capture***. Select ***LPT 1*** and click ***OK***.
5. Assign the network printer path to another parallel port designation such as ***LPT 3***. Set the printer to use that port or select a network print queue path.

Note

These instructions may vary depending on the Windows® version.

BIOS settings can also have an effect on parallel port performance. The SmarTrac supports only SPP parallel port communication. ECP and EPP modes are not supported. These instructions include editing the PC BIOS to ensure that the port is in the proper mode prior to staring Windows.

1. Click the **START** button, select ***Settings*** and then click ***Control Panel*** to open the **Control Panel** window.
2. Double Click the **System** icon to open the **System** window and then click the **Device Manager** tab.
3. Remove the parallel port by clicking ***Ports***, selecting the port and clicking the **Remove** button.
4. Shut down Windows.
5. Restart or Reset the computer.
6. Enter the PC BIOS setup. This is usually done by hitting the **DEL** key or **ESC** key during the boot sequence. Consult the computer manuals or contact the manufacturer for more information about entering BIOS setup.
7. Find the parallel port setup options and set the port to be SPP (not ECP or EPP). Also, make sure there is no DMA activity over with the port.
8. Save the BIOS settings and exit setup.
9. Restart the computer and allow Windows® to start up. Windows® should find the port and install it using the new settings.

Replacing the Blade

If plot quality suddenly degrades the blade might be dull or broken. The tip of the blade is very fragile and can chip or break if dropped. It is difficult to see when the blade is damaged. A magnifying glass can be helpful. To replace the blade:

1. Remove the adjustable blade foot by unscrewing it counter-clockwise.
2. Remove the old blade with a pair of needle nose pliers and discard it.
3. Slide the new blade into the blade until it bottoms out. The blade should spin freely.
4. Screw the foot onto the blade holder (clockwise). Stop just before the blade tip emerges.

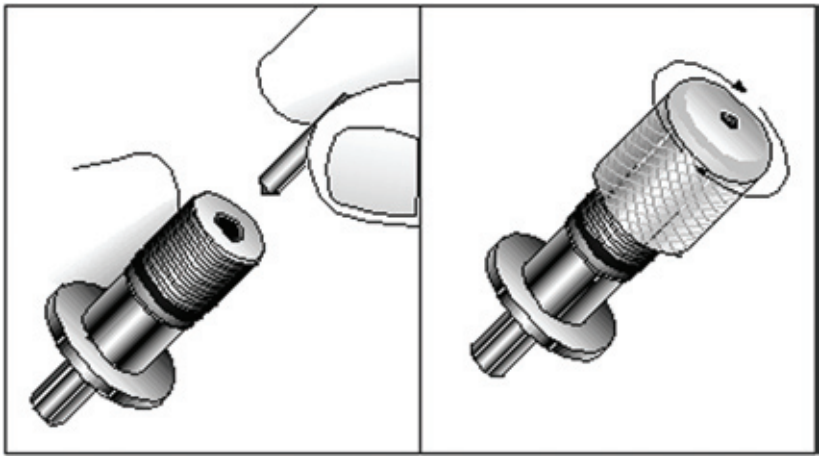


Figure 30. Replacing the blade.

5. Perform test cuts as described in the Cutting a Sign section before continuing to use the signcutter.

CAUTION

The blade tip is sharp and fragile. Be careful when handling it.

CAUTION

Warning: Do not use any cleaning agents (beside alcohol), water or brushes with metal bristles to clean parts of the plotter. Pay special attention to keeping the drive shaft bearings free of all liquids.

Cleaning the Drive Shaft

Clean the drive shaft regularly to make sure the cut lines remain accurate. To clean the drive shaft:

1. Turn off the signcutter and disconnect the power cord.
2. Remove any accumulated dust and residue with a stiff bristle brush.

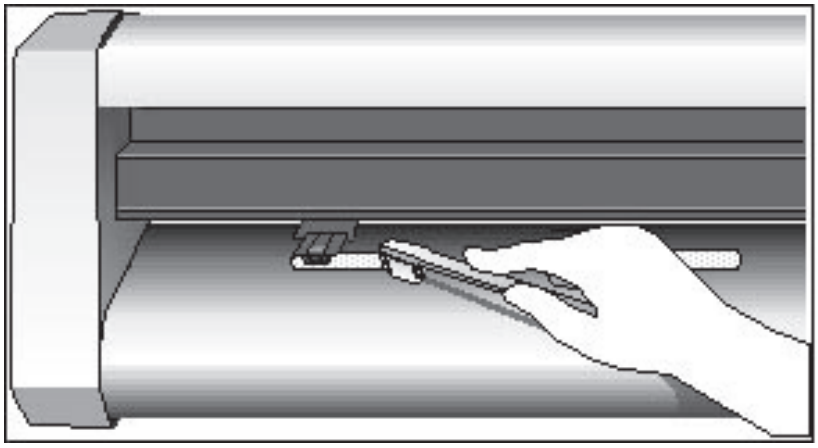


Figure 31. Cleaning the drive shaft.

Size Calibration

Over time, signcutters may require calibration to account for normal wear and tear. Typically, the accuracy of a cut is within 0.2% overall. By using the calibration feature, the variance can be adjusted to within 0.05%.

Prepare the signcutter:

1. Open the Ioline **Control Center** program. Put the signcutter in **START** mode (green LED).
2. Load the signcutter with material that is greater than 22-in wide (60-cm model) or greater than 30-in wide (80-cm or larger models) and a minimum of 48-in long. Install a blade holder (use vinyl material) or pen (use paper material) in the carriage. Enable **Autoloop** or manually create a service loop of material.
3. Move the carriage and material with the **Arrow** keys so that the blade or pen is about one inch from both the right and front edge of the material. Set an origin. *See the **Operation** chapter for more details on preparing to cut.*

Gather the Calibration Data:

1. Select ***Calibrate, Calibrate Plotter*** from the **Control Center Menu Bar**.
2. Select ***Calibration Plot*** to cut the factory stored calibration cut. The signcutter will plot a large box. (**Figure 32**.)

Note

The **Scale** command does not effect the calibration values.

3. Precisely measure both X-axis and Y-axis lines. Better accuracy in measurement equals better calibration.
4. Measure both sides and the top and bottom of the box.

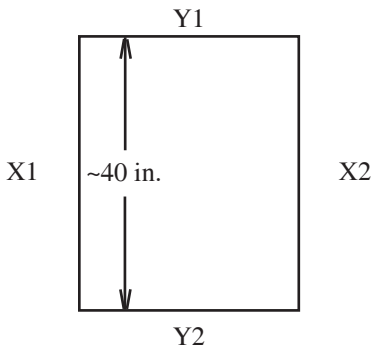


Figure 32. The **Calibration Box** and measurements.

5. Take the average of the horizontal (Y) values by adding them together and dividing by 2. Repeat this procedure for the vertical (X) values.

Example:

If X1 = 39.750 in. and X2 = 39.700 in.

The sum is 79.450 in. (39.750 in. + 39.700 in. = 79.450 in.).

The average is 39.725 in. (79.450 in. / 2 = 39.725 in.)

The X calibration value is the average, 39.725 in.

Enter the Calibration Data:

1. Enter the measured values in the boxes in the **Calibration** window. Make sure the SmarTrac is in **START** mode (green LED). Select the **Set Calibration** button.
2. The signcutter will send the calibration values and the new **Calibration Setting** will be displayed in the boxes in the window.
3. Click on ***Done*** when finished.

Hint

Sensor calibration is required if using any tool other than the Ioline blade holder (i.e. a ball point pen). Calibration is also required to switch back to the Ioline blade holder after calibrating for a different tool.

Calibrating the Sensor for Contour Cutting

The registration sensor is calibrated for the standard Ioline cutting tool at the factory before shipment. If the registration sensor if ever replaced or if tools other than the standard Ioline blade holder are used for registration, use the following process to recalibrate the sensor:

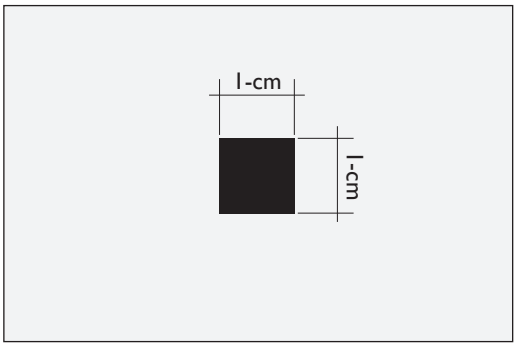


Figure 33. Print and measure a 1-cm black square on a white background.

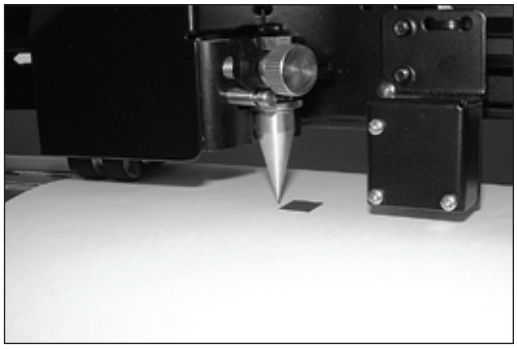


Figure 34. Registration tool in jaw.

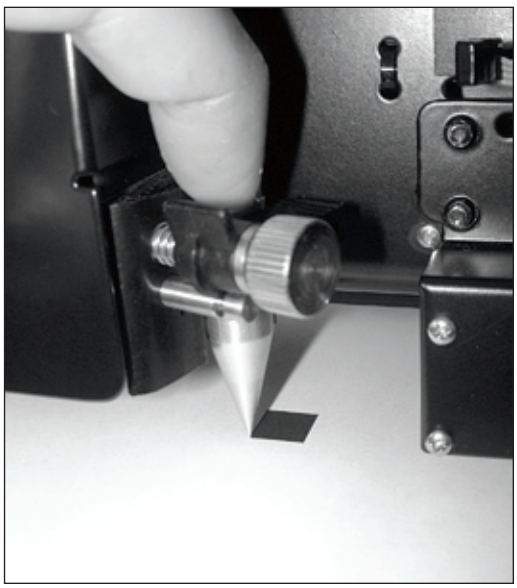


Figure 35. Press the tool down to verify the tip lines up with the corner of the box.

Prepare to Calibrate the Sensor

1. Print a black 1-cm square on a white background. Use the sensor calibration files, ***1cm_square.jpg*** or ***1cm_square.doc***, in ***C:\Ioline\Calibration*** to generate the square. Make sure that there is at least a margin of 3 inches from each edge of the material to the edges of the box. Printing the square in the center of a standard sheet of white paper is acceptable. Make sure to carefully measure the square after printing to ensure that it is exactly 1-cm.

2. Insert the tool that is used during registration into the tool jaw on the carriage. If calibrating for the Ioline blade holder, insert the registration tool (**Ioline PN 105745**) included in the **Accessory Kit**.
3. Move the carriage and material so that the tip of the tool is near the lower left corner of the black square.
4. Turn the **Speed** knob down to the minimum level and continue to position the carriage and material until the tip is exactly over the corner. Gently press the tool down onto the paper to ensure that the tip is lined up. *See the **Figure 35**.*
5. Press the **Set Origin** button on the keypad and ensure that the keypad light is **Green**.

Calibrate the Sensor

1. Open the Ioline **Control Center**. A shortcut is available in ***Start>Ioline***.

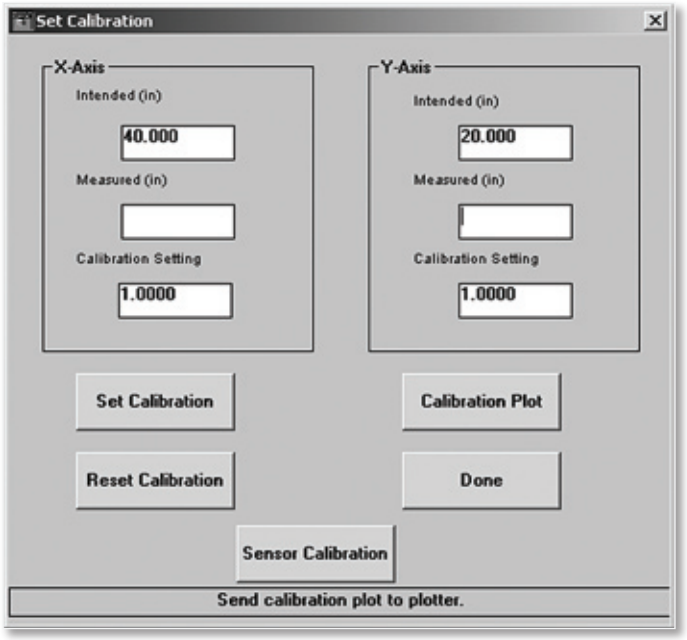


Figure 36. The **Control Center Calibration** window.

2. In the **Menu Bar**, choose ***Calibrate>Calibrate Plotter…*** (***Figure 36.***)
3. Press the **Sensor Calibration** button at the bottom of the window.
4. Ensure the cutter is ready with the tip of the tool positioned over the lower left corner of the black box and a **Green** keypad LED. Press the **Calibrate Sensor** button in the small window that appears. (***Figure 37.***)
5. The sensor will automatically perform the calibration process and update the four values in the windows.
6. Press **Done** when the process is complete.

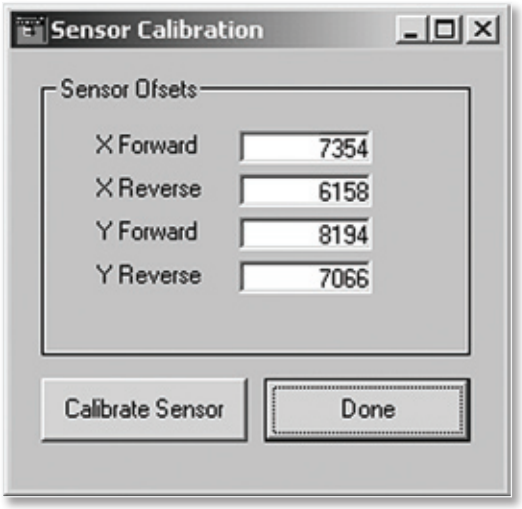


Figure 37. The Small Sensor **Calibration** window.

7. Perform test registration cuts to verify that alignment is correct. If it is not, check that the black box is exactly 1-cm then repeat the procedure again. Contact Ioline Customer Service if calibration is unsuccessful.

Chapter 6

End Notes

Service & Support

Ioline has many years of experience working with designers, graders and marker makers. Feel free to contact us if you have questions—or to share information.

Hint

SmarTrac Service manuals, technical bulletins, software updates and other information are available to SmarTrac owners on **www.ioline.com**. Access is free.

Getting Help

Ioline is committed to providing the highest quality service and support to its customers. If you need assistance with an Ioline SmarTrac, a number of resources are available:

1. First, refer to this ***SmarTrac User Guide*** for answers to your specific questions.
2. Many detailed troubleshooting and repair issues are listed in the ***SmarTrac Service Manual***, available upon request from Ioline Customer Service.
3. Consult the support section of the Ioline Web site: **www.ioline.com**.
4. For additional assistance, contact your local dealer or Ioline Customer Service. Contact information is listed under ***Customer Service*** in this chapter.

Any warranty servicing of this product not specifically described in this manual must be authorized in writing by Ioline Customer Service. You may obtain service by calling or faxing Ioline Customer Service. The technicians will help you determine the nature of the problem. If factory repair is necessary, you will receive a RMA (Return Material Authorization). Please gather the information indicated on the next page before contacting Ioline or your dealer.

1. When returning a machine, carefully package the equipment in its original container or packaging equivalent. You may purchase shipping containers from Ioline by contacting Ioline Customer Service. **Ioline is not responsible for any damage due to inadequate or improper packaging.**
2. Carefully wrap and secure all items in the shipping container to prevent damage. Seal the container and note the RMA number near the address block.

3. Ship the container using FED-EX or another approved carrier. COD shipments **ARE NOT ACCEPTED**. An Ioline representative will contact you prior to the start of work with an estimate of repair cost. All repairs are warranted for 90 days.

Customer Service

Ioline Corporation is committed to providing quality service and support to our customers. If you need assistance with an Ioline product, contact your local dealer or Ioline authorized service center. You may also contact:

Ioline Customer Service Department
Monday through Friday
7:00 A.M. - 5:00 P.M. U.S. Pacific Time
Voice: 1.425.398.8282
Fax: 1.425.398.8383
support@ioline.com
www.ioline.com

Your Comments Are Requested

Ioline Corporation is interested in comments on our documentation and products. Please send corrections or suggestions to:

Ioline Corporation

14140 NE 200th Street

Woodinville, WA 98072 USA

Voice: 1.425.398.8282

Fax: 1.425.398.8383

info@ioline.com

www.ioline.com

Before you contact Support…

Please gather the following information about your printer before contacting Ioline or your dealer for technical support:

Name:	
Company Name:	
Phone Number:	
Fax:	
E-mail:	
Model:	
Serial Number*:	
Date of purchase:	
Dealer:	
Type of material used:	
Type of Computer:	
Type of design software:	
New software or peripherals:	
Service history:	

* Look for the serial number above the power switch on the back side of the right cover.

The FCC Wants You to Know...

This equipment generates and uses radio frequency energy and, if not installed and used properly (in strict accordance with manufacturer instructions), it may cause interference to radio and television reception. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. If this equipment does cause interference to radio or television reception - which can be determined by turning the equipment off and on - you are encouraged to try to correct the problem by one or more of the following measures:

- Use only shielded interface cables.
- Reorient the receiving antenna.
- Relocate the host computer with respect to the receiver.
- Move the host computer away from the receiver.
- Plug the host computer into a different outlet so that the host computer and receiver are on different branch circuits.

If necessary, consult the dealer or an experienced radio/television technician for additional suggestions. ***How To Identify and Resolve Radio-TV Interference Problems,*** a booklet published by the Federal Communications Commission, is a helpful reference. Please contact the FCC to request a copy:

www.fcc.gov

Document stock number: 004-000-00345-4

This booklet is available from:

U.S. Government Printing Office

Washington, D.C. 20402

Note

This equipment was tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

Glossary

A

Acceleration - The rate that a signcutter changes the velocity of the carriage or the vinyl. Acceleration is measured in units of g (1 g = 32.2 ft/s^2). Higher acceleration can increase **throughput** but may degrade cut quality.

Arc - A segment of a circle, also called a curve.

Axis - The geometric guidelines used to place a coordinate. Used to determine pen or blade paths for signcutters.

B

Blade - Refers to the carbide steel cutting tool used by sign-cutting signcutters. Blades are specified by offset (tip distance from center) and angle (relative to vinyl). They are designed to work with many different materials.

Blade Bevel - Angle of the vertical cutting edge of a blade. Larger angles help the blade travel through thicker material that produce more drag between the blade and the medium.

Blade Offset - The distance the blade tip trails behind the center of the blade.

Blade Steering Arc - The arc followed by the center of the blade as it rotates around the (fixed) tip. This is used to align the blade in the direction of the next vector so no tearing occurs.

C

Calendered - Polyvinyl chloride (PVC) sheeting squeezed between a series of heated rollers to achieve a small enough thickness for cutting with a signcutter. Calendered film is generally thicker and less expensive than cast vinyl, but it sometimes tends to shrink or move back to its original thickness.

Cast - Polyvinyl chloride (PVC) sheeting formed by spreading a molten vinyl mixture on a carrier sheet or web, and then baking at high temperatures to remove solvents and fuse the remaining material into a film. Cast film is usually thinner and more expensive than calendered vinyl.

Control Panel - Panel on the right side of the machine where primary plotter functions are accessible. Also called the *Keypad*.

Coordinate - A point that can be referenced by its position on the X or Y axes of a signcutter. The use of line or arc segments to connect coordinates creates paths for pens and knives to follow when cutting.

Contour Cut - The contour cut feature provides an automatic registration process that, when combined with contour cut enabled design software, will read registration marks on a pre-printed image, send the position data to the software, then receive an 'adjusted' plot file that precisely cuts around the image.

Cut Sheet - A single piece of material that is loaded into the signcutter but is not pulled from a roll.

D

DM/PL - Programming instructions language used to connect a signcutter with a computer. DM/PL is used in the plotter drivers of some sign programs.

Drive Shaft - The motor driven shaft that moves material through a friction feed signcutter. The drive shaft has a rough surface that grips the material.

E

F

File Name Extensions - In MS-DOS® and Windows® based programs, the three letters after the period in a file name. In sign files the three letters denote a file

type, such as the vector and bitmap based Encapsulated Postscript (EPS) and the vector based Hewlett Packard® Graphics Language (PLT).

Flange - The projecting rim around the edge that holds the pen or blade holder to the tool carriage. The signcutter automatically recognizes when a pen or blade is installed and changes cutting parameters accordingly.

Font - Refers to the style and width of a particular design of letters, numbers, and symbols, such as Helvetica Bold or Times Roman.

Force - In cutting, the downward pressure exerted on a pen or blade tip to ease cutting through materials. Additional force can be added by adjusting the **Control Center Force** settings and updating the signcutter. Increasing the force will darken pen lines or aid in cutting thicker materials like tag board.

Friction feed - Process where the material is fed through a signcutter by placing it between a motor-driven drive shaft and tensioned pinchwheels.

G

H

HPGL Setting - The signcutter supports three industry standard signcutter languages: HPGL 7475, HPGL 7596, and DM/PL. Most design software uses DM/PL or HPGL 7475 which have a lower left origin. DM/PL cannot be selected in the Control Center because the signcutter will automatically recognize it. HPGL 7596 uses a center origin so cutting begins at the center of the intended cutting area.

I

Idler Wheel - Secondary wheels that help keep wide material flat during cutting.

J

K

Keypad - Panel on the right side of the machine where primary plotter functions are accessible. Also called the *Control Panel*.

L

M

Mil - Thousandths of an inch or milliinches. For example; 75 mils is the same as .075 inches. 1 mil is equal to .025mm.

Minimum Angle - This is the minimum angle for which the machine will perform a **Blade Steering Arc**.

N

O

Offset - The distance the tip of the blade trails behind the center of the blade.

Origin - Place marking the zero (0) coordinate on the X or Y axes. Used as a starting reference by signcutters for pen or blade paths.

Overcut - Distance the blade travels beyond the end of each cut vector.

Overlap - Amount of material cut in one panel (or tile) that duplicates what is done in the previous panel (or tile). The overlapped image allows for alignment when assembling and installing a large image.

P

Panel - Production area of a signcutter. Signcutters have a size limit along the Y axis (a few inches less than the width of the signcutter) and the X axis. If a job exceeds the production area, consecutive panels must be set up by the sign software. Also called tiling. Paneling a long cut will increase accuracy.

Parallel Communications - Method of sending information from a computer to a signcutter by sending 1 byte (8 bits) at a time through a cable. This method is faster than serial communication. The parallel port on a PC is a female (small holes) connector.

Plotter - A device that uses coordinates and vectors to create images. In electronic sign making, plotters recreate vectors on material with a set of coordinates stored in a computer file.

Pinchwheel - Wheeled roller, tensioned by springs, that clamps material between it and the drive shaft for transporting the material.

Pounce Pattern - A full sized pattern of any design to be painted. Once the pattern is created, the outline is perforated into paper using the **Pounce** feature. The pattern is then held firmly against the substrate and perforations patted with powder, charcoal or colored chalk dust, leaving an outline of the design.

Q

R

Registration Marks - Shapes printed on material that provide reference points for manual or automatic correction systems.

Resolution - The smallest distance that a signcutter can move the material or the carriage. Plotter resolution affects the accuracy that a plot file is reproduced on the material.

Roll Feed - A method of pulling material from a roll for plotting and cutting. Works in conjunction with panels.

S

Serial Communications - Method of sending information from a computer to a signcutter by sending 1 bit at a time through a cable. The serial port on a PC is a male (small pins) connector.

Service Loop - Slack material between the material roll and the signcutter.

Stencil - A thin sheet of material into which a design is cut. When a stencil is placed on another substrate and paint or ink is applied, the image represented by the cut out portion of the stencil is printed on the substrate below it.

T

Tag Board - A heavy paper (usually 150 pound) that is used in the apparel industry for cutting patterns and stencils.

Tangential Cutting - When enabled, the tangential cutting feature carefully aligns the blade with a line segment before making each cut in the material, offering cleaner cuts on thicker materials.

Throughput - The speed at which a signcutter completes a job. Represents the ability to process information and produce an image.

U

V

Vector - In computerized sign making, a line segment between two coordinates, on which a pen or blade path can be created for cutting.

Vinyl - Polyvinyl chloride (PVC) film that, in sign making, is backed with an adhesive that will create a strong bond to a surface when pressure is applied.

W

Weeding - Process of pulling extraneous material away from a cut sign leaving only the sections representing the intended design.

X

X-Axis - Theoretical horizontal line providing a lengthwise reference point for signcutters. Associated with vinyl movement over the platen on the signcutter.

Y

Y-Axis - Theoretical vertical line providing a longitudinal reference point for signcutters. Associated with carriage movement on the signcutter.

Z

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